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PC WORLD

March 1993

THE FASTEST PCs

24 Fully Loaded 486DX2 Screamers Starting at $2,000

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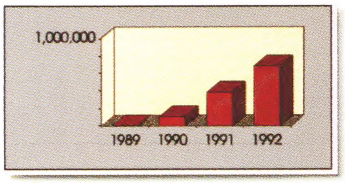
d define it.

to everyday tasks. And other innovative features, like drag-and-drop movement of text or graphics that lets you easily rearrange your page layout any way you want.

Then, to be sure that all of these features worked for WordPerfect users, we had them put to the test in the real world, with the help of the folks at the National Software Testing Labs.

From November 1989 to August 1992, over half a million WordPerfect users have switched to Microsoft Word for Windows.

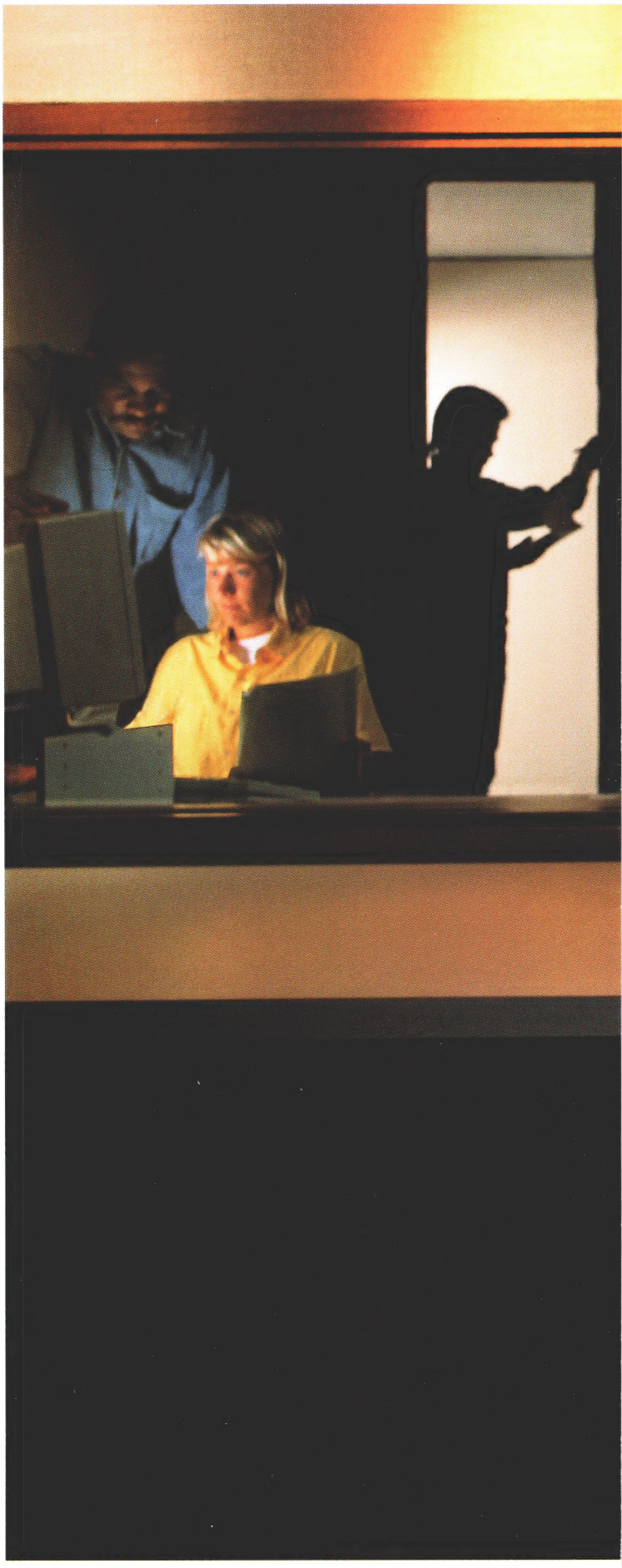


After conducting in-depth tests in 10 cities, from Los Angeles to New York, the National Software Testing Labs discovered that for ease-of-use, nearly 8 out of 10 WordPerfect users chose Microsoft Word for Windows over WordPerfect for Windows.

But WordPerfect users aren't the only ones who prefer Microsoft Word for Windows. Recently, it was awarded "Best Buy" by *PC World*. And the "Editors' Choice" by *PC Magazine*.

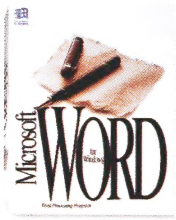
For more information on how to make the switch to the leading word processor for Windows, call us at (800) 426-9400, Department HY9. And discover why, for over half a million people, Word for Windows has become the latest chapter in the development of word processing.

Microsoft®
Making it easier



United States, customers can call us at (800) 426-9400, Department. HY9. Outside the United States and Canada, call Microsoft Corporation. WordPerfect is a registered trademark of WordPerfect Corporation.

After all, they helpe



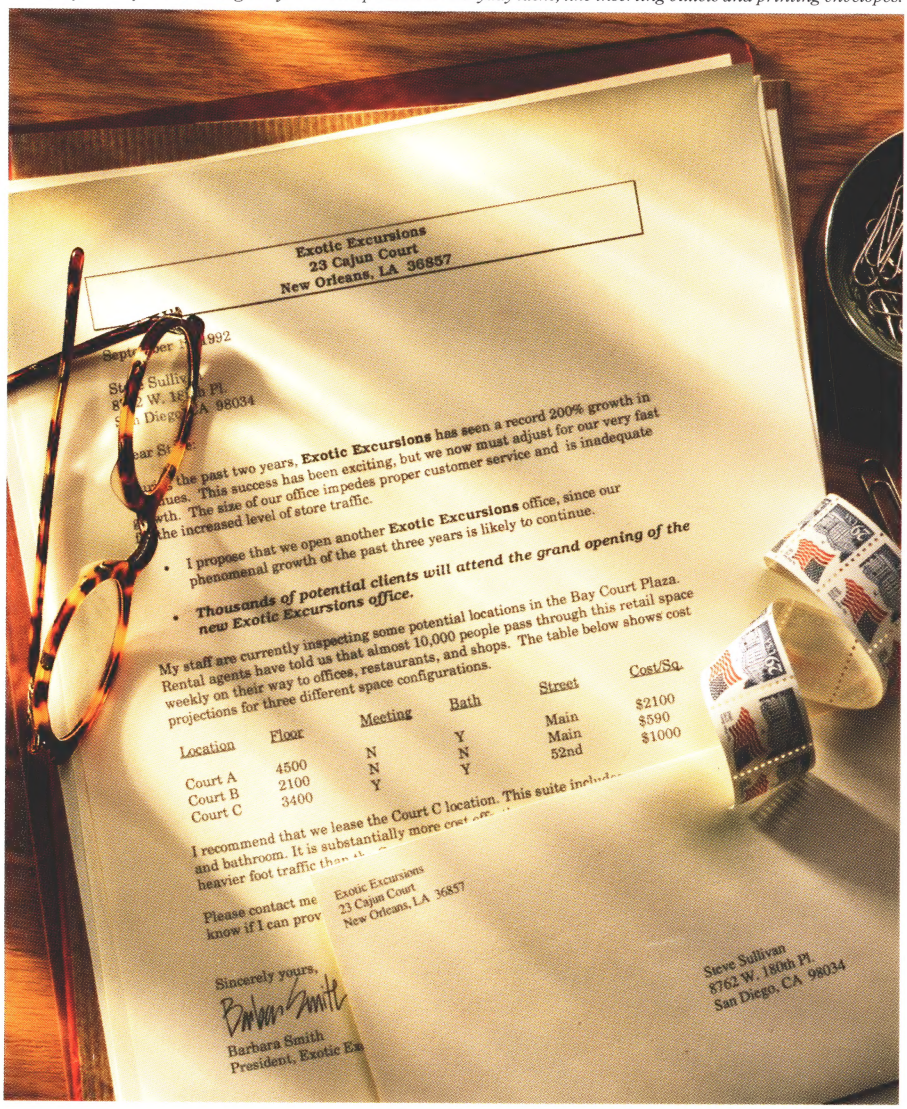
At last count, more than half a million WordPerfect® for DOS users have switched to Microsoft® Word version 2.0 for Windows.™ And there are plenty of good reasons why.

First of all, WordPerfect for DOS users helped us create Word for Windows, and actually made it easier.

Throughout the development of Word for Windows, we invited WordPerfect users to try it out on the things they do every day at work, like letters, memos, and even big reports. We call these types of sessions "usability studies."

It's an important part of the process we go through in developing all our software. Because "usability studies" help us find out the way in which people use their computers, and how we can make it easier.

Microsoft Word for Windows gives you one-step access to everyday tasks, like inserting bullets and printing envelopes.



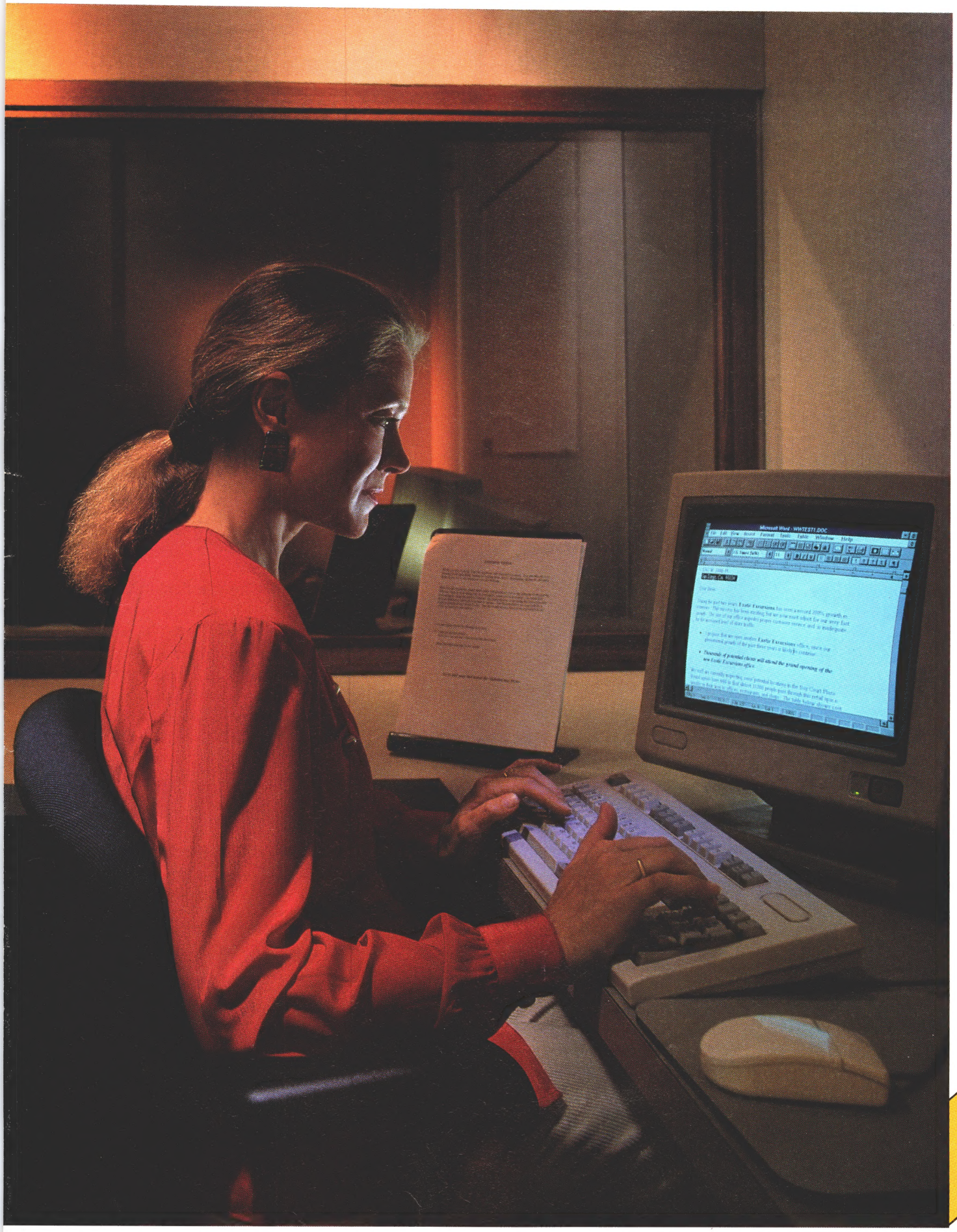
In this case, we were able to design a number of innovative and time-saving features into Word for Windows that can make not only the things you do every day easier, but also the transition from WordPerfect.

For example, it reads WordPerfect files. Better yet, just type in your familiar WordPerfect commands and Word for Windows shows you the equivalent commands. So you can learn as you work.

We've also added a customizable Toolbar that gives you one-step access

This three-dimensional bar chart, which was created in Word for Windows, shows the approximate total numbers of WordPerfect for DOS users who have switched to Microsoft Word for Windows each year. For more information inside the 50 (206) 936-8661. Customers in Canada, call (800) 563-9048. © 1992 Microsoft Corporation. All rights reserved. Printed in the United States. Microsoft is a registered trademark and Windows is a trademark of

It's not surprising that WordPerfect users are switching to Microsoft Word for Windows.


Microsoft Word - WHTE3T1.DOC

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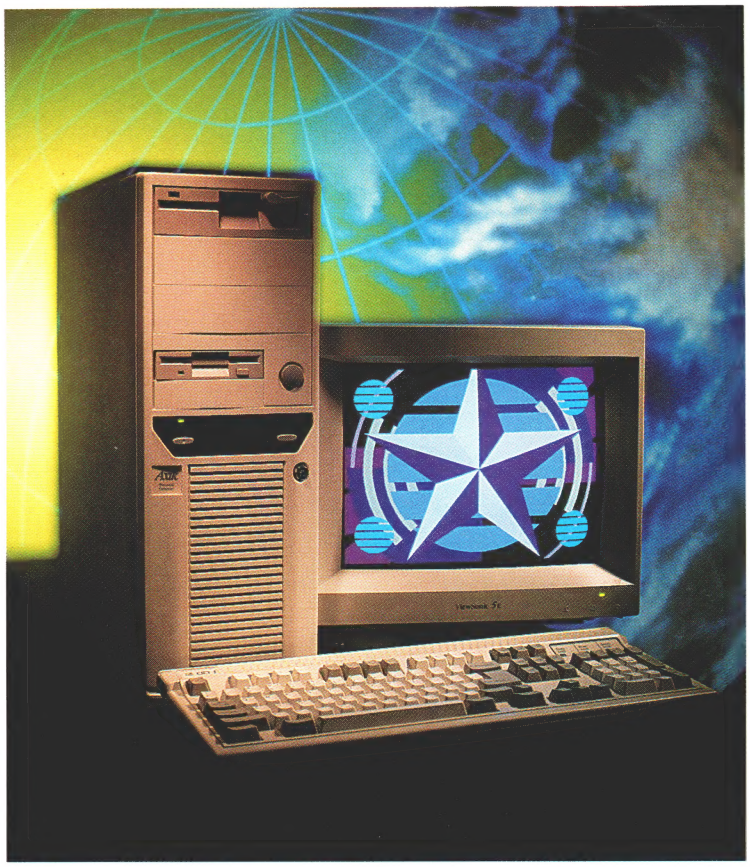

Consumer Alert

134 Is Your New Software Secondhand?
Shrink-wrapped software is always fresh from the factory, unused and virus-free, right? Not so. As we discovered, there's more than a slight chance that the software you're buying has been used before. Here's how to tell if you're getting what you paid for and what to do if you're not.

Hard Disks

144 Tips to Organize Your Hard Disk
If you ever wander aimlessly up and down your directory trees searching for critical files, now's the time to get organized. These tips for tidying up your hard disk will mean faster searches, greater convenience, and an extra dose of security.

Cover Story

486DX2-66s: Fastest PCs in the Universe

108 Clocking in as the fastest PCs we've tested yet, these 486DX2-66s will keep you running in high gear at low cost for years to come. From an outstanding group of 24 systems, our reviewers choose 5 that deliver unbeatable performance and value.

112 AcerPower 486e DX2/66
112 Amax 486DX2/66 ISAmax
113 AST Bravo 4/66d Model 123B
113 ATronics Int'l ATI-486/66
114 Axik Ace Cache 486DX2-66
114 Blackship BLK 486DX2/66
114 CAF Technology CAF Gold 6B2
115 Compaq Deskpro 4/66i
115 DEC DECpc 466d2 LP
116 Dell Computer 486D/66
116 DFI 486-66 DX2
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Cover photograph by Robert Cardin, digital composition by Varitel Select

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50 DOS 6: More Utility, More Power
Due in April, the new DOS adds backup and other utilities, all at no extra cost.

53 PC Tools Comes to Windows
A feature-packed utility and shell.

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Cutting-edge power for less.

56 A Complete Windows Communicator
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Consumers wait as shortages continue.

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Jargon-free, fill-in-the-forms accounting.

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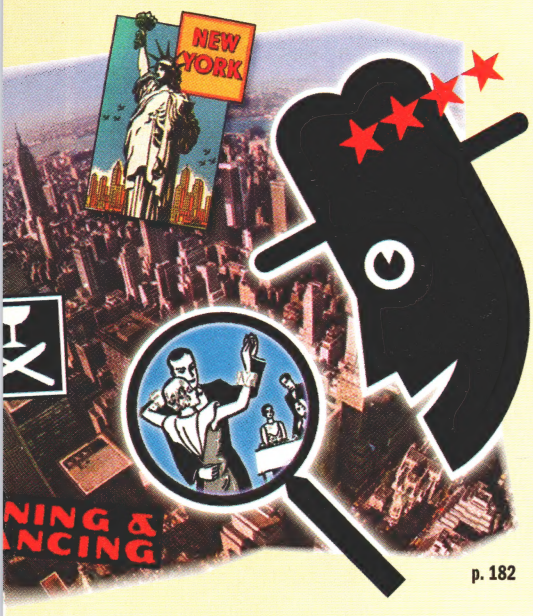

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Personal Finance

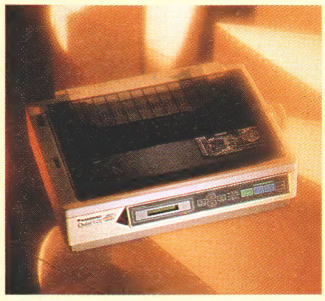
163 Deep in the Art of Taxes
When you buy a personal tax program, you should get more than a computerized calculator. What else do today's tax packages give you, and do they measure up to an accountant? Our reviewers report mixed results when they test seven under-$100 programs for accuracy, ease of use, and sophistication.

Printers

175 Dot Matrix Lives!
Less expensive than lasers, the new generation of 24-pin dot matrix printers are quick, quiet, and make short work of jobs most lasers can't touch. Here's a guide to 32 models priced from $269 to $749.

Reference

182 Getting There With Software Maps
Whether guiding you through cities or demographic databases, software-based maps can help you analyze and present information in more efficient, colorful ways than ever before. Survey the field with this guide to the latest travel and mapping software.



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–PC Magazine, January 26, 1993

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–PC World, February 1993, BEST BUY

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$1595	2095	2395	2795	**486DX-33**
$1695	2195	2495	2895	**486DX2-50**
$1795	2295	2595	2995	**486DX2-66**
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	■	■	■	1.44MB Teac floppy drive
■				ZEOS 14" high-resolution mono VGA monitor
	■	■	■	ZEOS 14" high-resolution 1024x768 non-interlaced monitor
.28	.28	.28	.28	Monitor dot pitch (mm)
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PC MAGAZINE EDITORS' CHOICE February 11, 1992 Austin 486 33 Winstation

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Money-Back Guarantee	60 Days	30 Days
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T I N

Circle 10 on reader service card

Paying again and again for virus protection is enough to make you ill.

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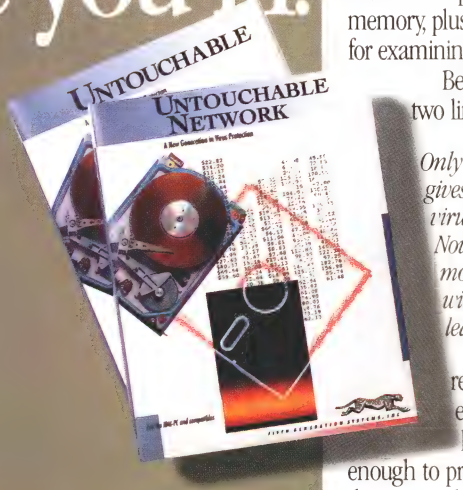

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FIFTH GENERATION SYSTEMS, INC

Circle 81 on reader service card

Hot Deals and Thin Margins

More than ever, it's a buyer's market. A quick example: At this writing you can purchase *Microsoft Office for Windows*, which includes *Excel, Word for Windows, PowerPoint,* and *Mail,* for less than $500 on the street. That's four applications for the suggested retail price of one.

So what's the catch? As Associate Editor Roberta Furger reports in "Is Your New Software Secondhand?" truly great deals like Microsoft's—along with industrywide competitive upgrades, money-back guarantees, and the like—are slicing retailers' margins. As a result, some are cutting corners by reselling returned software, with consequences ranging from annoying to disastrous.

Furger learned of this practice two years ago from one of her most reliable sources—a letter to *Consumer Watch.* A reader complained that his supposedly new copy of Quarterdeck's *QEMM* was registered to someone else. Since then, Furger has received an increasing number of letters describing shrink-wrapped software with torn disk envelopes, missing or mangled documentation, and even the occasional virus.

The complaints led Furger to wonder how widespread the phenomenon was. All but one chain of software retailers we talked to had an official policy of returning opened software to the manufacturer. But with an estimated return rate of 15 percent, the administrative overhead was apparently too big for some stores to bear. Many were simply firing up the shrink-wrap machine and putting the rewrapped packages back on the shelf.

Furger called on *PC World* contributors around the country to investigate major chains by buying, marking, returning, and tracking software. The results of this study, beginning on page 134, may surprise you. This special report also provides some simple tips to help you avoid getting stuck with secondhand goods.

In the wake of this *PC World* investigation, one chain has instituted a policy of scanning all returned software for viruses. The risk of virus infection aside, Furger believes that there is a basic consumer issue at stake. "It's like buying food or medicine," says Furger. "When you buy something that you think is new, it ought to be new, whether or not it's got anything wrong with it."

MICHELLE CLEMENT

Hardware Fire Sale

If software retailers think that they have it rough, they should get a taste of the margins that hardware vendors endure. As this month's cover story ("DX2-66s: Fastest PCs in the Universe") reveals, you can buy a system with the speediest Intel CPU for a mere $2041, complete with 202MB hard disk, super-VGA monitor, and 8MB of RAM. You'd be hard-pressed to assemble a cheaper 66-MHz DX2 system from parts.

The PC World Test Center subjected 24 DX2-66 scorchers to exhaustive application-based benchmarks (the industry-standard BAPCo test, plus our own *Windows 3.1* suite) for 12 hours of runtime testing on each system. When the smoke cleared, six machines were the swiftest PCs of any kind we've tested.

Think for a minute. When was the last time you could buy a member of the fastest class of PCs, fully configured, for $2000? Not in the 8088, 286, or 386 eras. Even more remarkable, the quality and quantity of service and support continue to climb; a year's free on-site service is the rule, with four of the systems offering two-year warranties and two of them providing three-year warranties. It leaves us wondering just how low hardware prices can go and how much value vendors can add before they start squeezing each other out of existence.

PC World Editor
Eric Knorr

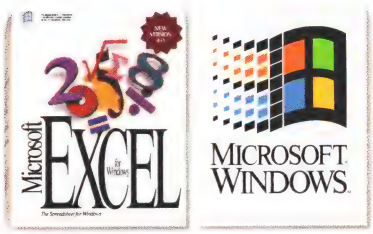
In fact, we had to pull one system from the review because the company went out of business. Before we went to press, another manufacturer expired, and two others (one of them Everex, a major player that had been responsible for much groundbreaking technology) filed for Chapter 11.

As consumers, we want it all—our money back if we don't like a program, incredibly fast and cheap PCs with lifetime warranties, and low prices. As Furger's special report and this month's system review demonstrate, the vendors are stretching themselves to the limit to meet these demands. That may mean tough sledding for them, but for you it means the best value that the industry has ever delivered.

Eric Knorr

Eric Knorr, Editor

We figured it would take a Wizard to make your job easier.



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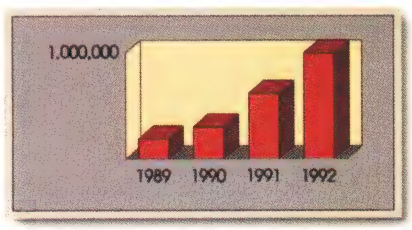

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logos? Am I asking too many questions?

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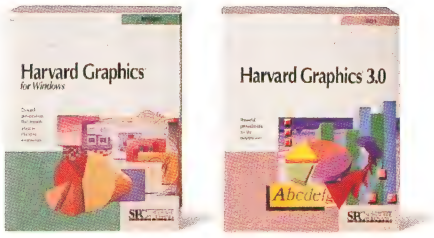

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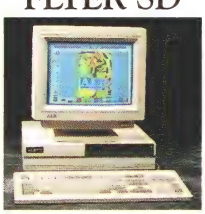

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Circle 9 on reader service card

CPUs to Dream About, OS/2 Treated Fairly, Windows NT Humor

The Affordability Fallacy

Compliments to Eric Knorr on his comprehensive and easy to understand article "The Complete Guide to the New CPUs" in the December issue. Even a PC novice could understand the difference in the chips and options available. However, Knorr's statement that the fastest and latest systems are affordable at $2500 is the most common fallacy in PC land. I deal with customers who want a machine that will run *Windows* and DOS software without breaking their budget.

Doug Stephens, Paris, Idaho

An Eye for Detail

In "The Complete Guide to the New CPUs" you state in a graphic that a math coprocessor has no effect on *Windows*. Yet when I look at another graphic showing the relative performance of several chips, something doesn't quite make sense. If the coprocessor has no effect, why did *Windows* performance increase with the chips that added an optional math coprocessor?

Gavin McCollam
Bismarck, North Dakota

Editor's response: Sharp eye! Adding a math coprocessor did indeed result in better *Windows* scores. To reflect typical business usage, our *Windows* test suite includes *Excel* floating point operations—a fact we should have made clearer in the article. Drop those operations from the mix, and a math coprocessor offers no performance improvement.

Newcomer Treated Fairly

Of all the computer magazines I read, only yours has consistently given OS/2 2.0 a fair shake. It was heartening to see that this product with so much potential was recognized by your readers ["The Readers' Choice: World Class 1992" in December] as one of this year's most promising newcomers.

John Bodnar, Austin, Texas

A Guide to the Universe

Thumbs up on the new format! The new games column, *Managers of the Universe*, is a welcome addition. I'd like to see a comparison or review of *SimEarth* and *Civilization*.

I am concerned, though, about advice offered in the December issue. In "486SX-25s vs. 386DX-40s: The Upstart Fights Back," you say that "systems using the 386-40 represent better values than those using the 486SX-25." A mere 41 pages later, in "The Complete Guide to the New CPUs," you advise, "Don't buy a desktop that uses an Intel 386. You may save a little cash up front, but PCs based on Intel's 486 now clearly offer better performance for the money."

As a longtime subscriber who bases buying decisions on what I read in *PC World*, I depend on your articles for guidance. Unless you can give me a good explanation for these seemingly contradictory statements, I'm looking for a new guide.

Michael Baker, Springfield, Illinois

Editor's response: The 386-40 referred to in "486SX-25s vs. 386DX-40s" was from AMD, not Intel. The AMD 40-MHz CPU delivers performance in the 486SX-25 range; Intel's fastest 386 chip runs at only 33 MHz. As for games, we reviewed *Civilization* last month and plan to review *SimLife*—the latest offering from the makers of *SimEarth*—next month.

DOS for 2010

In "Windows NT: A DOS for the '90s" in your December issue, Scott Spanbauer states that Windows NT can address 4 gigabytes of memory, a "limitation you're unlikely to bump up against in this lifetime." I wonder if the IBM engineers thought the same thing when they decided on the 640K limitation for DOS.

William R. Rondello, Jr.
Sterling Heights, Michigan

Laugh if You Can

First, *PC Computing* brought us Penn Jillette. *PC World* fought back with Scott Spanbauer's "Windows NT: A DOS for the '90s." We haven't laughed so hard in months.

Until RAM drops to $5 per megabyte and hard drives are even cheaper, no normal user is going to rush to install

NT. Even at today's amazingly low prices we aren't going to dump our XTs and buy new systems.

Spanbauer makes us laugh—and we appreciate it. We're glad that *PC World* is on the cutting edge of PC humor.

William Norwood, Dennis, Texas

Old Friend Returns

While browsing through the December issue, I came across the question about printing from Cardfile ("Cardfile Guile") in *Here's How: Windows*. I was astounded to learn why my old printer would not work with a generic printer driver. I had even called technical support, but to no avail. Thanks to a side comment in that article, I now have the use of my trusted, if obsolete, printer.

H. Clay Wilson, Allen, Texas

JOTTOWORLD

Up to a Point

Being in the market for a new 486 system, I found your product reviews and ratings in recent issues helpful—to a point.

On page 98 of your January issue, you state that "We sent letters to the top system vendors . . . " and "Everyone sent us some kind of 486." As a reader very much interested in comparisons of the top vendors' systems, it was frustrating and puzzling to find that companies such as Gateway 2000, Northgate, and Zeos are apparently not considered to be among the top system vendors.

I realize it's impractical to cover all the hundreds of system vendors. Nevertheless, to exclude such major players from a comparison of the top systems limits the usefulness of an otherwise valuable feature.
Trevor H. Atkinson, via fax

Editor's response: We solicited systems from all of the companies you mentioned. But with today's quick product line turnovers, it's impossible to include every product we'd like to review each month. We looked at a 33-MHz Gateway 2000 4SX-33V, but we had to leave it out of our January review because its video drivers weren't finalized and the system didn't complete our new test suite. Gateway subsequently updated its drivers, and its 66-MHz 4DX2-66V won a Best Buy in this month's system review. Northgate's system arrived too late for review. And while the new product line from Zeos wasn't quite ready for review in January, Zeos's new 33-MHz 486DX earned a Best Buy in February.

We run a system review in every issue. So if the PC you're interested in doesn't appear in this month's roundup, you're likely to find it in a future issue. —*Rex Farrance*

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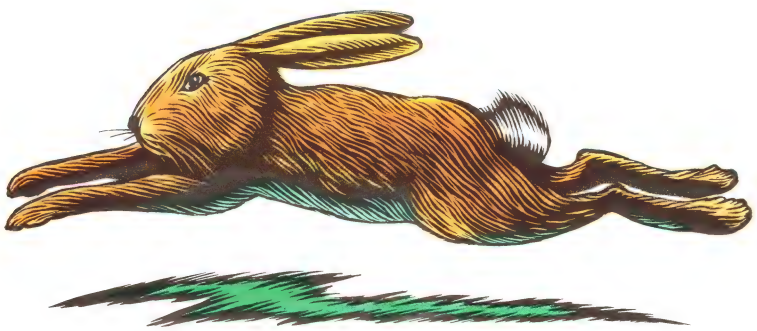

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Nerds in the Know

The December article "Tape Backups You Set and Forget" carries an important message and is full of useful information. Perhaps, though, it stops a bit short.

More could have been said about parallel port external drives and their ease of use, their capability to back up notebooks, and the convenience they offer when you need to back up multiple computers.

Also, it would have been helpful if the author had discussed the various tape formats. Try to find a QIC-80 on a manufacturer's package or in a vendor's ad. They all say something like DC2000, DC2060, DC2080, or DC2120, but those are not interchangeable in the same drive. This is another case where you could break down the arrogance of the nerds in the know by letting the rest of us in on the secret.
Forrest E. Stanley, Bakersfield, California

The Two Faces of Num Lock

I recently received my first issue—December—of *PC World*. Robert Lauriston's program in *Help Line* to turn Num Lock off more than paid for my subscription.
Honsell Thompson, Pikeville, Kentucky

I am tired of reading about whining users who can't get on with their miserable lives because their Num Lock is on. It seems every other issue of each computer magazine publishes some new script for getting these pathetic souls out of their private hell. Your December issue was the worst yet:

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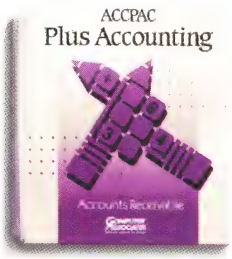

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not one, but two columns about turning off Num Lock (*Help Line* and *Dialog Box*). The 101-key keyboard has been with us since 1985 and is here to stay. Deal with it!
Robert Flaminio, Hercules, California

Breathless Kick-Off

Your new department *Real Problems, Real Solutions* could potentially be of considerable benefit. Unfortunately, your kick-off in the November 1992 issue was somewhat breathless. Are we to believe that the MIS director and nine technical staffers were so out of touch that they hadn't seen the dozens of articles about getting *Windows* to run better that have appeared in *PC World* in the last three years?

What is most disturbing (from the point of view of a U.S. taxpayer) is the wasted money and effort. If ten computer professionals can't come up with the right answer, and no one bothers to talk to a consultant, the real solution is a personnel upgrade.
Patrick Andrew, Edinburgh, Scotland

Circle 159 on reader service card

Corrections and Clarifications

In the *Top of the News* piece in December "'Tis Better to Send Than to Receive," we misidentified the company that purchased ZSoft. WordStar bought ZSoft.

In January's *Here's How: Data Management*, we listed a *Paradox* script for printing a single, multitable invoice during data entry. In order to use the script, you would have to change several words to match your own database; these words were to be printed in boldface for easy identification.

Unfortunately, they weren't. Here is a corrected, boldfaced listing. *PC World* regrets the errors.

```
;Change "Invoice #" to your field name
invnum = [Invoice #]
DO_IT!
MESSAGE
 "Printing invoice...please wait"
ECHO OFF
CLEARALL
;Change "Invlines" to your detail table
;of invoice information
MENU {Ask} {Invlines}
CHECK
;Change "Invoice #" to your field name
MOVETO [Invoice #]
TYPEIN invnum
DO_IT!
;Change "Invlines" to your detail table
COPYREPORT "Invlines" "R" "Answer" "R"
INSTANTREPORT
CLEARALL
;Change "Invoices" to your parent table
VIEW "Invoices"
;Change "Invoice #" to your field name
MOVETO [Invoice #]
LOCATE invnum
FORMKEY
COEDITKEY  ;or EDITKEY
```

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Swiss 721 Bold
Swiss 721 Bold Italic
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Swiss 721 Black Condensed
Formal Script 421
Park Avenue™
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Courier 10 Pitch Italic
Bitstream Cooper Black
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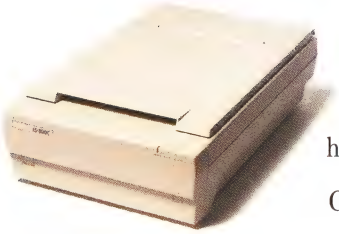

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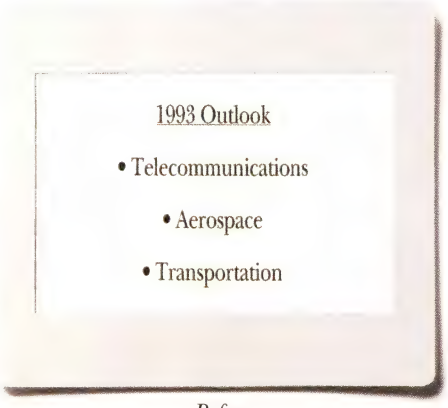
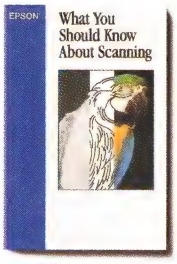


Before.

After.



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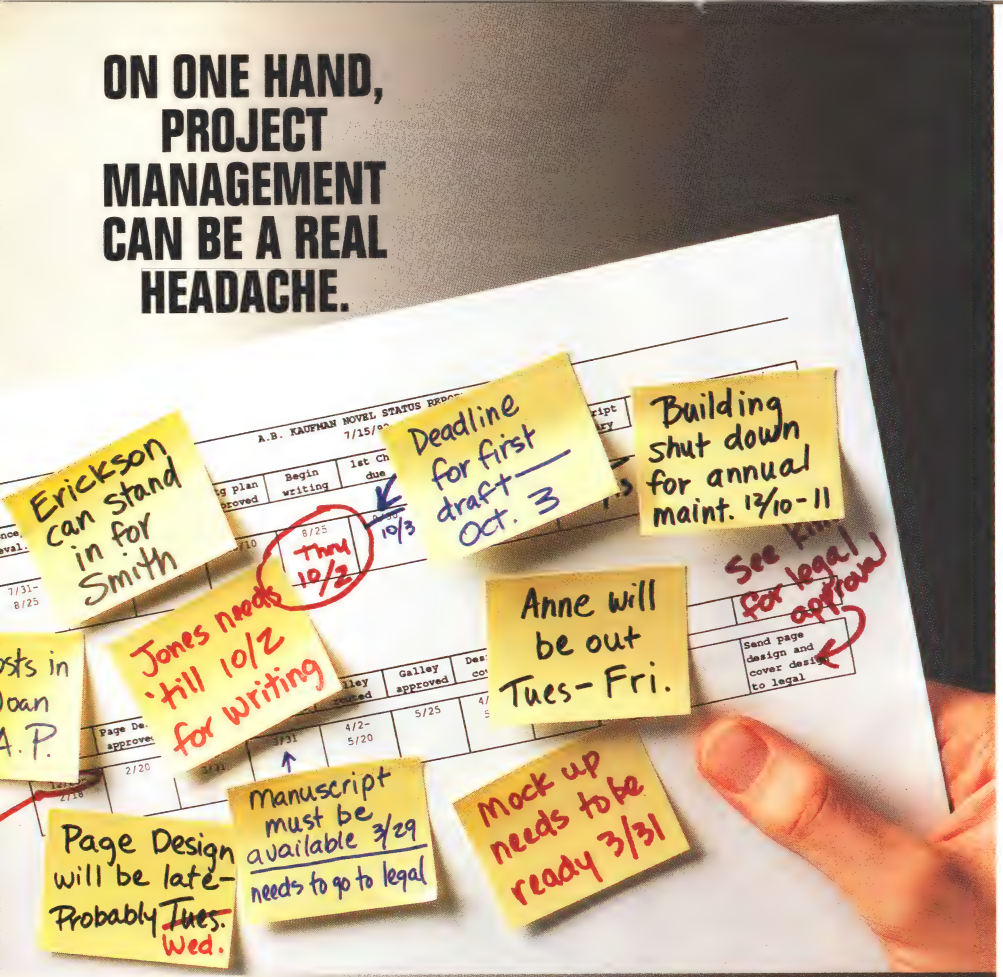
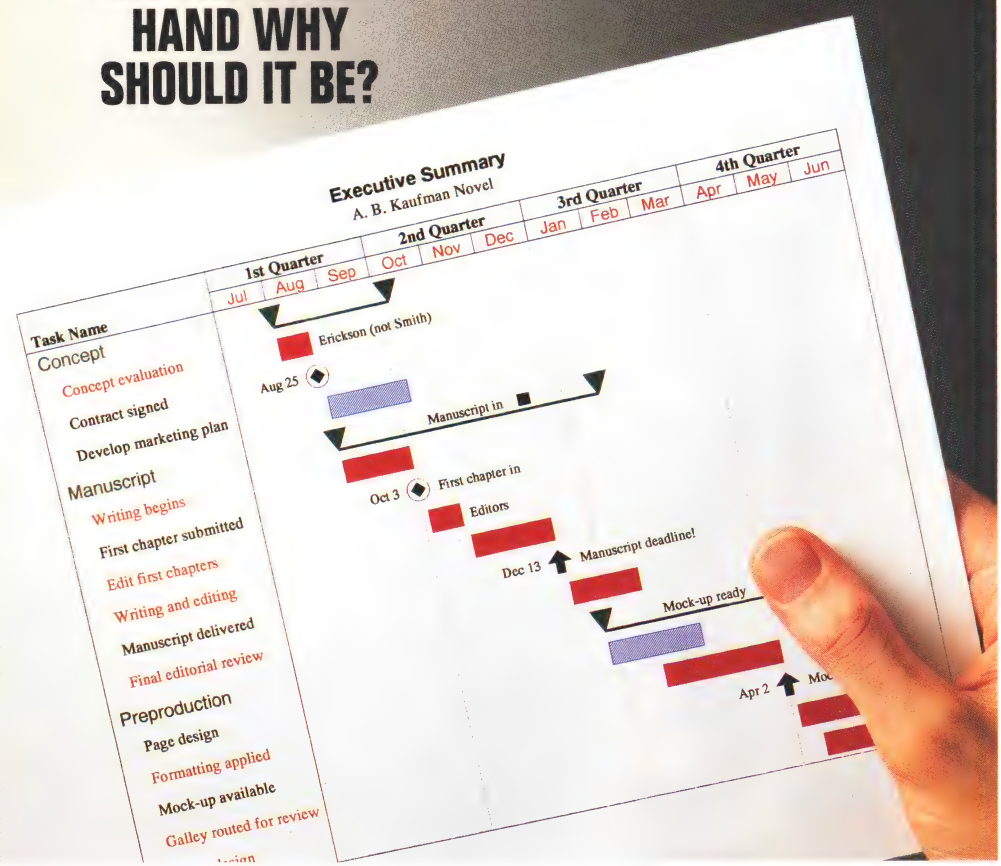


ON THE OTHER HAND WHY SHOULD IT BE?



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Hard Disk Warranties: More–or Less–Than Meets the Eye

When you buy a new hard drive that comes with a five-year warranty, you probably expect to be covered if the drive fails after four years. Surprise! When it comes to hard drives, warranty coverage may not be all that it seems.

Just ask Dr. Geoff Smith, president of Wesco Technologies of San Clemente, California. Smith had maxed out all 220MB of his office computer's hard disk with program and data files. Rather than spending several thousand dollars on a new computer, he decided to buy a second drive.

Warranty Woes

Recognizing the importance of having a reliable drive backed by a strong manufacturer's warranty, Smith began shopping to see which company offered the best warranty. After reading through ads and product literature, Smith settled on Fujitsu, which offers a five-year warranty on all its drives, and began calling around for the best price. He found a good one—offered by Hard Drives International—but when it came time to place his order, Smith discovered that his new drive came with a one-year warranty from HDI rather than a full five-year warranty from Fujitsu.

Smith's experience is not uncommon in the hard drive market and is certainly not limited to drives made by Fujitsu or sold by Hard Drives International. A survey of mail-order advertisements for hard drives from a variety of leading companies indicates that price isn't the only thing that varies from one reseller to the next. Depending on the reseller, the same drive could be advertised with a one-year or five-year warranty—or with no discussion of the warranty. Similarly, some resellers said they handled warranty claims, while others said those were the manufacturer's responsibility.

By Roberta Furger

"There has been some confusion in the way warranties have been offered," says Matt Keowen, director of marketing services at Fujitsu. Warranties on Fujitsu drives, like those on drives from several manufacturers, including Seagate, Conner, and Maxtor, are typically handled by resellers, who determine the length of the warranty and handle its administration.

ROBERT HOLMGREN

PC World Consumer Watch editor Roberta Furger

According to Keowen, the focus on resellers rather than on end users is a carryover from a time when drives were sold almost exclusively to PC manufacturers—not end users—for inclusion in desktop computers. "The purchase price was determined by all the things the PC manufacturers wanted us to provide, including the length of warranty coverage," says Keowen. PC manufacturers keen on getting the lowest possible price could opt for a shorter warranty. The market for hard drives is now considerably broader (they're now sold to end users as well as to value-added resellers, distributors, retail chains, and PC makers), but the old reseller-oriented policies still apply.

Return to Reseller

That means you may not get the full manufacturer's warranty when you buy a new drive—it's up to the reseller from whom you buy it. It also means that when the drive fails, you don't go back to the manufacturer (except in rare circumstances). You go to the reseller, which ships the drive back to the manufacturer, which ships a replacement to the reseller, which sends it to you.

To be sure, virtually every manufacturer vows to stand behind its drive should the reseller be unwilling or unable to help. But with a few exceptions, they're not set up to deal with end-user inquiries. The bottom line: Drives have not been sold with the end user in mind. They often come without detailed installation instructions, unless the reseller includes them as a value-added service. (Hard Drives International, for example, provides very detailed installation instructions that its own staff has prepared.) Similarly, you won't always find a manufacturer's warranty card in the box—which makes it difficult to know what the terms and conditions are.

This is changing, however, and manufacturers are beginning to offer innovative warranties and services that reflect the growing end-user interest in their products. Fujitsu, for example, expects to start providing five-year end-user warranties on all its hard drives early this year: No matter where you buy the drive, the warranty (detailed on a card included with every unit) should be

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BUG WATCH

FreezeFrame 1.0

This graphics conversion and file capture program may freeze up when users try to convert a graphics file type that the program does not support, such as a Macintosh GIF file. Users report that after *FreezeFrame*'s conversion module issues an error message, the program occasionally locks up, requiring users to complete a full rebooting of the system. DeltaPoint officials said they are aware of the bug and plan to fix it in the next version of *FreezeFrame*.

DeltaPoint
408/648-4000

Quicken Version 2.0 for Windows

Some users of this personal finance software are finding their checking accounts out of balance due to an error in *Quicken for Windows*' year-end file copying feature. The problem has appeared most commonly following an upgrade to this latest release. (The bug was fixed in *2.0* release 5 of the software, so copies of *Quicken for Windows* purchased after November 13, 1992, should not be affected.) Users can get a free copy of the fix on disk by calling Intuit's tech support line.

Intuit (technical support)
415/858-6050

Norton AntiVirus 2.1

Symantec has reported that some copies of its virus protection software can transmit false indications of system infection after users copy an updated virus definitions file from the Norton BBS or from Norton's CompuServe forum onto their systems. At that point, *Norton AntiVirus* begins incorrectly alerting users that their system is infected with MtE, the so-called Dark Avenger Mutating Engine.

Version 2.1.3 of *NAV* is free of this confusing bug. If you own an affected copy of *Norton Antivirus*, a free patch (PTCH-1A.ZIP) is available for download from Symantec's BBS and the Norton forum on CompuServe (GO NORTON), or by calling Norton's technical support. Symantec recommends reinstalling *Norton AntiVirus* in an empty directory, installing the patch file, then reinstalling the updated virus definitions file.

Symantec
310/449-4900 (technical support)

—Richard Melville

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Richard Melville is an editorial intern for PC World.

available to all registered owners. Although users will still have the option of going through their reseller, they will also have the chance to deal directly with Fujitsu.

Other hard drive manufacturers are also focusing on the end user. Seagate's hard drive warranties are still geared toward system manufacturers and resellers, but the company has established an Orphan Program for users who can't get assistance from their reseller. These individuals can contact Seagate's customer service department on a toll-free line. Repairs are free if the unit is still under warranty. Quantum, for its part, now offers a renewable warranty on most of its drives that's available to all Quantum drive owners, independent of the reseller. If your drive fails while still under warranty, you get a replacement drive, and the warranty clock is reset to zero. So if your drive fails 22 months into a two-year warranty, you get a full two-year extension on the replacement unit. Neat, huh?

A word of caution, though: While many drive manufacturers are taking steps in the right direction, not all are adopting end-user policies. Therefore, before buying a drive, ask the reseller a few questions—and then get your answers in writing:

- What's the length of the warranty?
- Who services the warranty—the reseller or the manufacturer? (Ideally, you'd get the option of going to either place.)
- Are failed drives replaced with new drives or reconditioned ones? (Often you'll get a refurbished drive should yours fail while under warranty.)
- What's the average replacement time?

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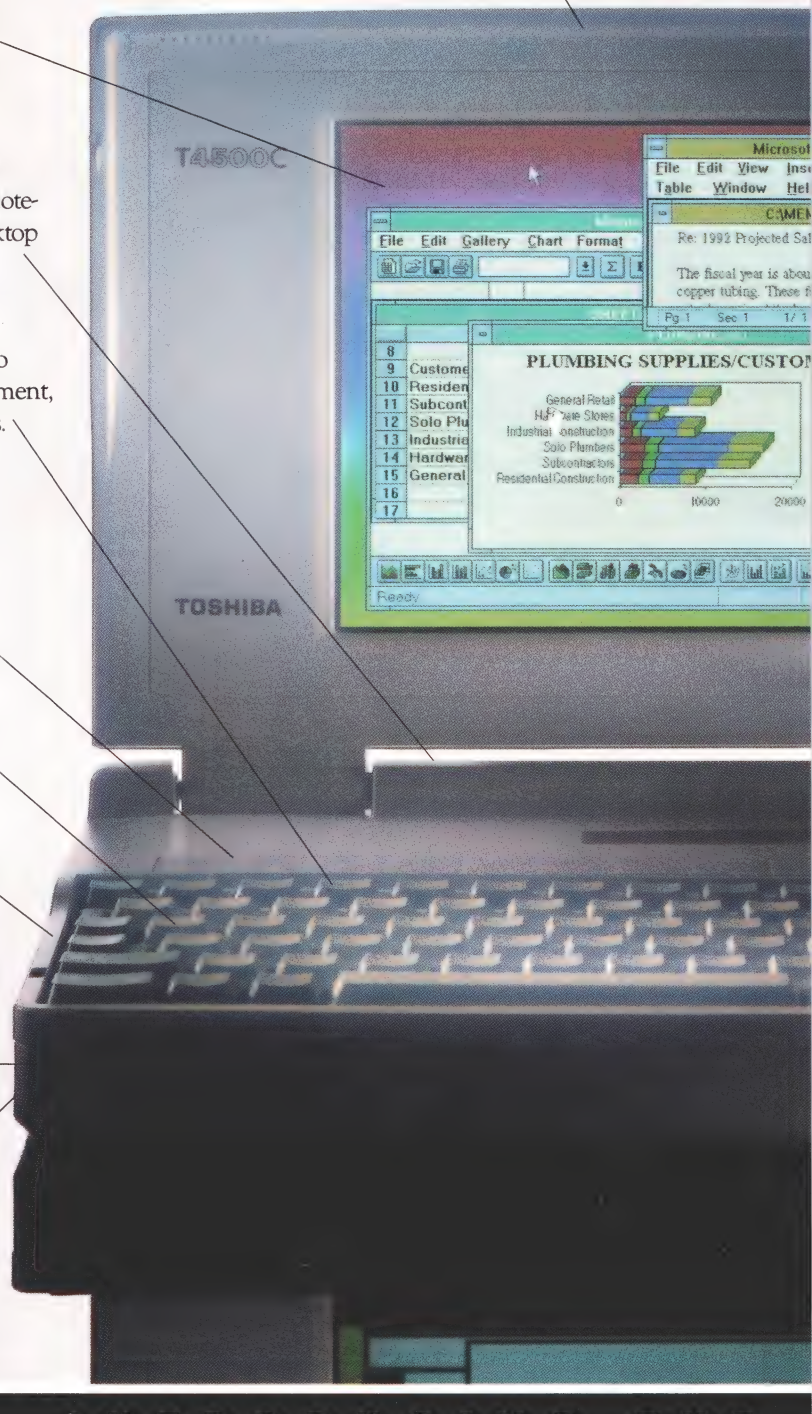

INTRODUCING THE

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Shop Talk

Perils of International Purchasing

Two years ago I purchased *Microsoft Works* in Spanish at a local store. Then I received MS-DOS 5.0 as a gift from an American friend. I also bought *Windows 3.1* at a store in Los Angeles shortly after it was released. I have mailed all the registration cards and still retain all the original disks, manuals, registration card tear-offs, invoices, and so on to prove ownership. However, in each case I have been ignored by Microsoft: no promised newsletter, no update information, not even a simple acknowledgment. And though I consider myself a loyal customer, I am not eager to pay full price for revisions of these products.

Christian Hess, San José, Costa Rica

Editor's note: According to Microsoft, international customers are supposed to receive support (from update information and discounts to phone support) locally. According to Renee Greenup, Microsoft international public relations coordinator, this policy applies whether customers are using an English version of a product or a foreign-language version and regardless of where it was purchased.

Unfortunately, though, many international distributors and resellers don't offer customer service and support. Out of frustration, users contact Microsoft, which in turn refers them to someone local. If you're an international user who is feeling abandoned, try contact your nearest Microsoft Product Service and Support Subsidiary. Each of these offices, Greenup says, is fully equipped to handle any questions users may have.

Central American and Caribbean users should contact the Microsoft subsidiary in Venezuela via fax at 58-2-923-835; European users can reach the Microsoft office in France via fax at 33-146-351-030; and Asian customers should contact the Japan office via fax at 81-3-54-84-0757. International customers might also consider using the Microsoft forum on CompuServe, which is available 24 hours a day (call 800/841-8199 for more information). A Spanish-language

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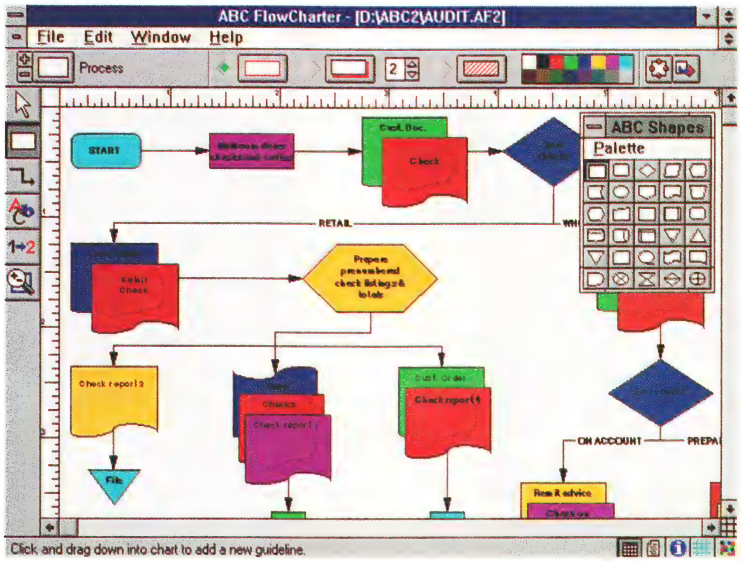

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> *DBMS Magazine*
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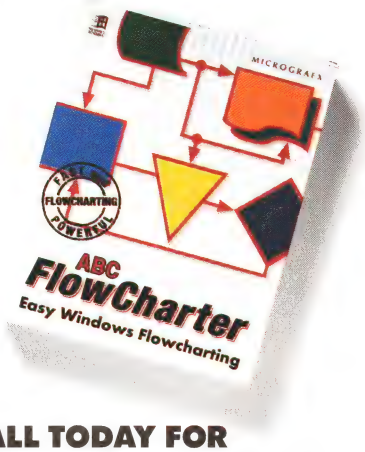

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version of the Microsoft forum was scheduled to go on line early this year.

Misleading Information

Last year, on behalf of a client, I began looking for a lightweight notebook with an optional external battery charger. Among the units I evaluated was the Twinhead Slimnote. As part of my research, I contacted both my local value-added reseller and the Twinhead corporate offices in New Jersey. Twinhead staff told me that though this unit did not have an external battery charger, third-party vendors offered a compatible charger. I accepted this information and bought the Slimnote. After receiving the unit, I began my search for the external charger—with no success. When I tried contacting Twinhead again, they told me they knew of no such third-party vendors.

Doug Meskell
Fountainhead Consultants, Inc.
Norcross, Georgia

Editor's note: Doug Moglin, marketing manager at Twinhead, confirmed that there is currently no external adapter available from either Twinhead or a third-party manufacturer. Although he could not explain why Meskell was given incorrect information, Moglin told *Consumer Watch* that he has notified all sales personnel of the options available either from Twinhead or a third party to eliminate any similar confusion. Further, "in compensation for his difficulties," Twinhead also supplied Meskell with an AC/DC adapter for a car.

E-Mail and Faxes Are Great, But . . .

I use electronic mail and fax to negotiate for and buy supplies. Are these messages as legally binding as signed paper letters?

James R. Ash, Katy, Texas

Editor's note: According to Jeffrey Kingston, a computer law attorney and partner in the San Francisco firm of Brobeck, Phleger, and Harrison, in most cases faxes and E-mail messages are acceptable means of handling business transactions. "But there are also risks associated with conducting business using these types of media," he notes, particularly if disagreements arise over the terms of a deal. Traditional written contracts, says Kingston, include all the history of an agreement, together with verification that the person entering into the deal is in fact authorized to do so. The minute you start shedding elements of formality, says Kingston, such as the signed and notarized contract, upholding an agreement in a dispute becomes increasingly difficult. Agreements negotiated via E-mail and fax can raise questions about who actually sent the correspondence and whether they were authorized to do so. While these issues shouldn't keep you from conducting business with E-mail and faxes, you should take care to follow up and get a signed paper copy for your records.

Think you've gotten a raw deal—or a great one? Mail the details to Consumer Watch, PC World, *501 Second St. #600, San Francisco, CA 94107; or send them electronically to PC World Online, Consumer Watch; MCI Mail, PC World Editorial; CompuServe, 74055,412; or 415/442-1891 (fax). We'll investigate complaints and publish letters with the broadest interest.* ■

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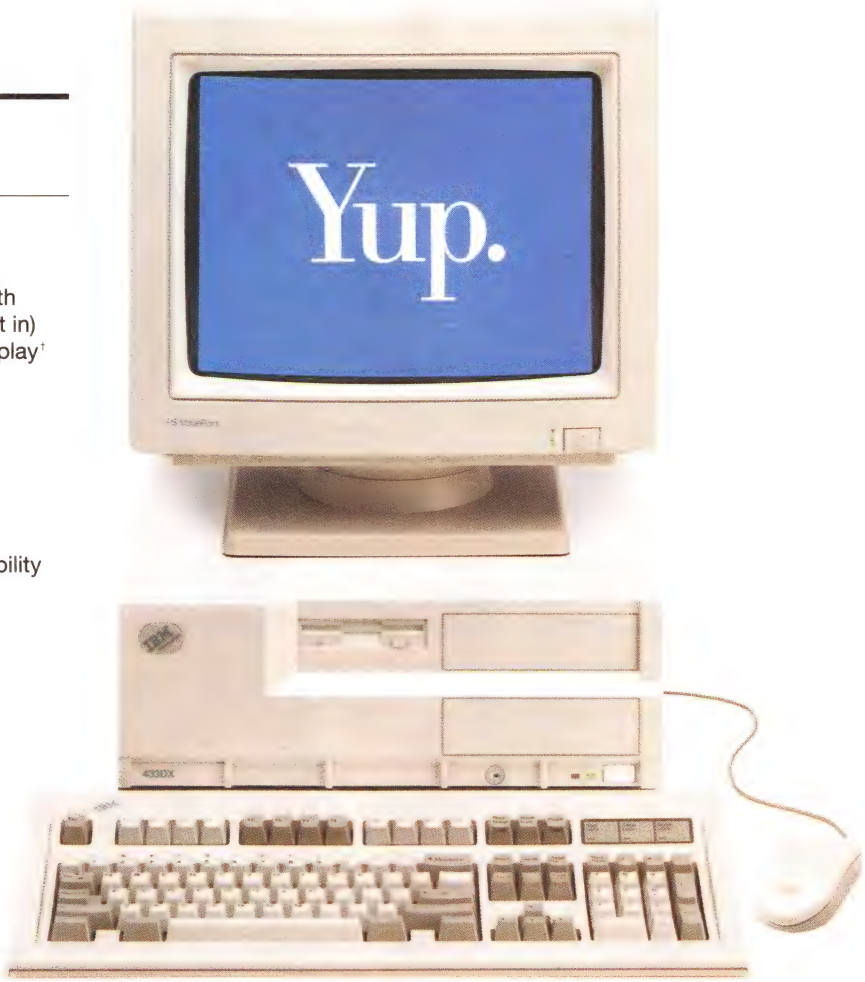

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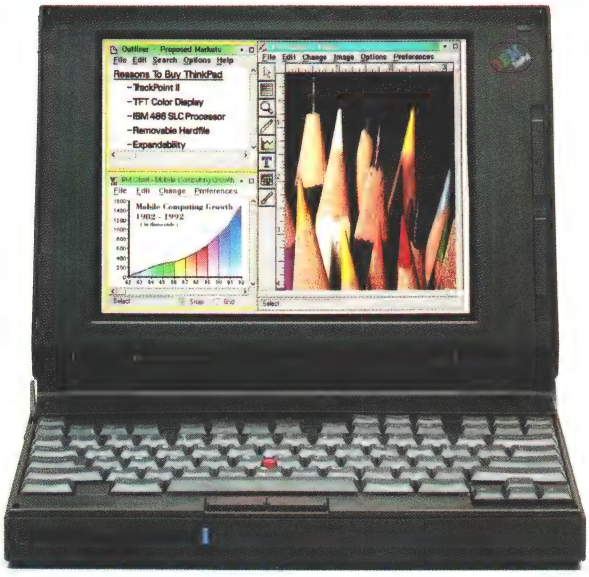

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† ThinkPad 300 and 700C systems and options are manufactured in Japan. PS/ValuePoint 6312, 6314 and 6319 Color Displays are manufactured in Korea.
†† PRODIGY will not run without a modem. A modem is not included with the ThinkPad 700C. A customer who acquires the ThinkPad 700C and a modem which operates at a speed below 9600 bps may contact Prodigy to obtain a One-Month Free Trial Membership.

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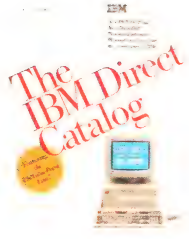

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A Business Plan for the Nineties

You've just emerged from your twelfth business meeting of the day. A pile of faxes has taken over your chair, your voice mailbox is full, and the report you sweated bullets over has landed back on your desk for major revisions. Suddenly the idea of branching out on your own has new appeal. But how do you manage to go into business without going into hock? This month Judy Merrill, a partner in the San Francisco Bay Area public-relations firm Shepherd Merrill Communications Group, gives her blueprint for creating the "virtual company"—mixing the best of the corporate and entrepreneurial worlds with the help of personal computers. —*Ed.*

Creating the Virtual Office

Ever since I started working for a big company, I've dreamt of being my own boss. My problem was figuring out how to maintain access to first-class resources and highly skilled professionals without having to rent office space, buy a ton of furniture and equipment, and become somebody else's boss.

Last year, with the help of Robin Shepherd, Gail De Lano, and Vicki Wagner, I finally did it. Inspired by William Davidow and Michael Malone's *The Virtual Corporation* (Harper Business, New York, 1992), we formed the Shepherd Merrill Communications Group (SMCG), a public-relations firm representing high-tech companies. SMCG helps these firms position and launch new products, write business plans and annual reports, schedule meetings with the media, and so on.

But SMCG is a company without walls. There's no executive suite, no lushly carpeted meeting rooms, no receptionist or assistants. Each partner works independently from her own office. And thanks to personal computers and fax machines, we can provide the same services as a bigger operation at a fraction of the cost.

Setting Up Shop

How did we do it? First we established some basic operating procedures. We set up a consistent rate structure for each partner and decided that each of us would be responsible for drumming up new business and keeping our own books. To create a consistent look for everything that goes out to our clients, we designed a stylebook with templates for fax cover sheets, press releases, reports, memos, and invoices. We agreed to meet at least once a month to brainstorm and discuss the status of each project. Being equal partners, we each chose our own computers, peripherals, telephones, and other office equipment. Two of us picked PCs, the other two chose Macintoshes.

It didn't take us long to realize that the key to making this kind of company work was setting up effective communications. Suddenly we were dealing with four partners, ten clients, and hundreds of professional contacts—many in different time zones, on different schedules, and with different sets of priorities.

While the telephone is our lifeline, we also rely on fax-modems and fax machines to stay in touch with the outside world. We use Phoenix Technologies' *PhoenixFax for Windows* and send-only fax boards to transmit computer-created documents, and stand-alone fax machines to send and receive hard copy. (They're also handy for making quick one-page photocopies.) On-line services such as MCI Mail and CompuServe are essential for transferring files and sending important E-mail to our customers and each other. For clients who aren't connected to these systems, we transfer files directly between computers using communications software such as Hilgraeve's *HyperAccess for Windows* and Software Venture Group's *MicroPhone II*. And instead of hiring a receptionist, we use answering machines and commercial voice-mail services such as Pacific Bell's Message Center.

Clockwise from top left: Shepherd Merrill's Robin Shepherd, Judy Merrill, Gail De Lano, Vicki Wagner

But even the best communications setup isn't worth very much if you're not able to share files. Because we frequently collaborate on press releases, slide presentations, and other documents, we needed programs that would let us send files from *Windows* PCs to Mac and back, but with the formatting intact. That's why we standardized on software that offers cross-platform com-

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patibility, such as *Microsoft Word*. We also use the Macintosh and *Windows* versions of *Timeslips* for tracking our billable hours and Intuit's *Quicken* for accounting. For tracking media contacts, generating reports, and building targeted mailing lists, we employ three different databases—Borland's *Paradox*, Claris's *FileMaker* for the Macintosh, and Portfolio Software's *Dynodex;* we use comma-delimited ASCII format to trade files back and forth.

Lean and Mean

Coming together as a team has several obvious benefits. We're able to share our expertise and pool our resources. For example, we split the cost of hiring a graphic designer to create our logo, and get a better deal at the print shop and office supply stores by ordering in bulk.

But the real beauty of this arrangement is that we can be as big or as small as we want, depending on the client's needs. Each partner has a database with the names of hundreds of freelance writers, photographers, designers, couriers, and industry contacts. When I have a big project, I get on the phone and assemble my team. When the project's done, the team disbands. We don't have to worry about training employees or paying staff salaries when business is slow—a savings we can pass along to our clients.

It's true, sometimes I miss the personal interaction you get every day in the corporate world. But the support and expertise I get from my colleagues, as well as the ability to make my own rules about when and how hard I work, far outweigh this disadvantage. Best of all, I'm able to focus all my efforts toward helping clients, without spending valuable time on meetings and other less productive corporate activities.

If you use PCs to manage people and other resources in a business environment, we want to hear from you. Send your article idea—including a brief outline of your company, job, problem, and solution as well as your name, address, and phone number—to Real Problems, Real Solutions, PC World, *501 Second St. #600, San Francisco, CA 94107; or send it electronically to PC World Online, Real Problems, Real Solutions; or 415/442-1891 (fax); or call us at 415/978-3224. We pay $300 per published column. Sorry, we cannot acknowledge submitted materials.*

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"Best Buy"

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"The BJ-200 is whisper quiet while printing, which makes it a pleasant neighbor for any computer. Even better, however, is its small footprint."

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The computer industry has spoken, and the message is loud and clear.

To sum it all up, the Canon® Bubble Jet™ 200 desktop printer is super fast, whisper quiet and conveniently compact.

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For more information, or for the name of your nearest Canon dealer, give us a phone call at 1-800-848-4123. We hope to hear from you soon.

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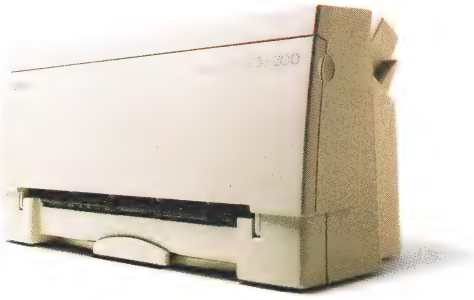
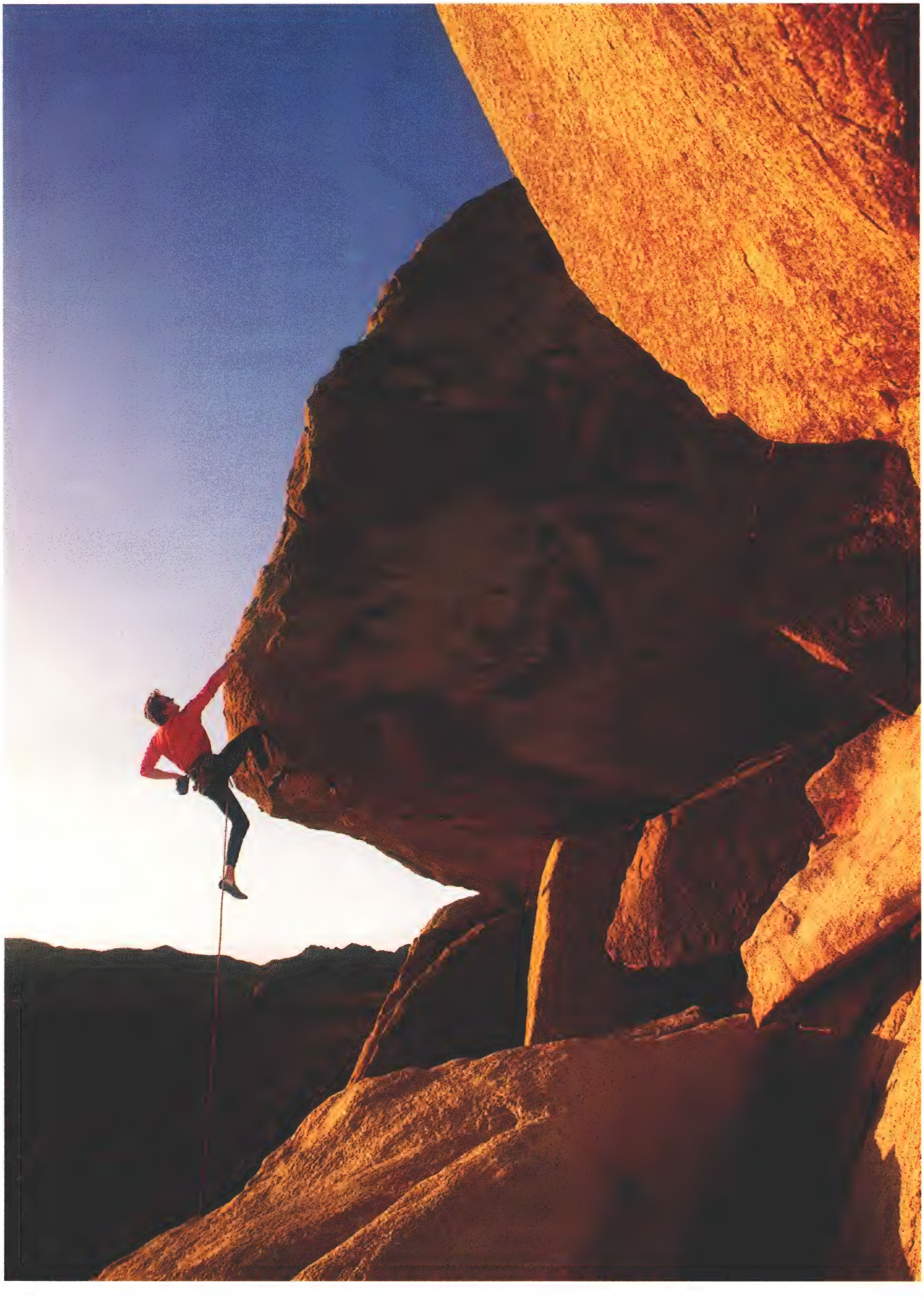


**Dealer prices may vary, but most dealers sell the BJ-200 at prices under $400.* PC MAGAZINE *quote reprinted from "*PC MAGAZINE*," December 22, 1992. Copyright ©1992 Ziff Communications Company. Canon is a registered trademark of Canon Inc. Canon Computer Systems, Inc., 123 E. Paularino Ave., Costa Mesa, CA 92628. For the nearest dealer in Canada, call (800) 387-1241.*



People always seek the most direct route to achieve their goals. So you've probably been looking for a database like Microsoft Access.

We'd like to tell all database users and programmers about a great new shortcut. It's called Microsoft Access™ – a database management system for Windows™ that can give you something no other database can. Easy access to powerful features.

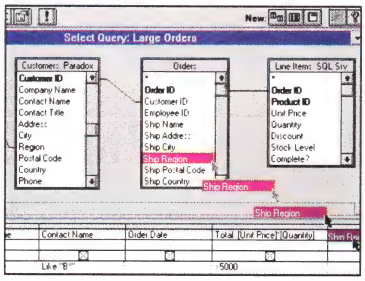
To start with, Microsoft Access takes complete advantage of the Microsoft® Windows operating system. Which means it has never been easier to create great-looking forms and reports. Plus you can store objects like pictures, graphs, sound and video. Right in your database files.

And if you ever get stuck, there are ReportWizards, FormWizards and ChartWizards to come to your rescue. They'll ask you questions about format, content and style. Then they'll automatically create your report, form or chart.

There are also Cue Cards to walk you through the most difficult database tasks. Guiding you one step at a time.

In addition, it's easy to create complex queries by using the graphical Query By Example. You just drag and drop tables, join fields, and plug in all of the specifics.

And you developers can write sophisticated database applications with Access Basic. A powerful, extensible programming language.



Create complex queries visually with our graphical Query By Example.

What's more, Microsoft Access can easily read and write all the major database formats directly, including dBASE®, Paradox® and Microsoft SQL Server. So you and your coworkers can still use all your old files, no matter what format they are in. That means your investment is safe, and everyone can easily migrate to Microsoft Access at their own pace.

To receive additional information on Microsoft Access, call (800) 882-2000, Dept. JH4. We'll give it to you straight.

Microsoft®
Making it easier

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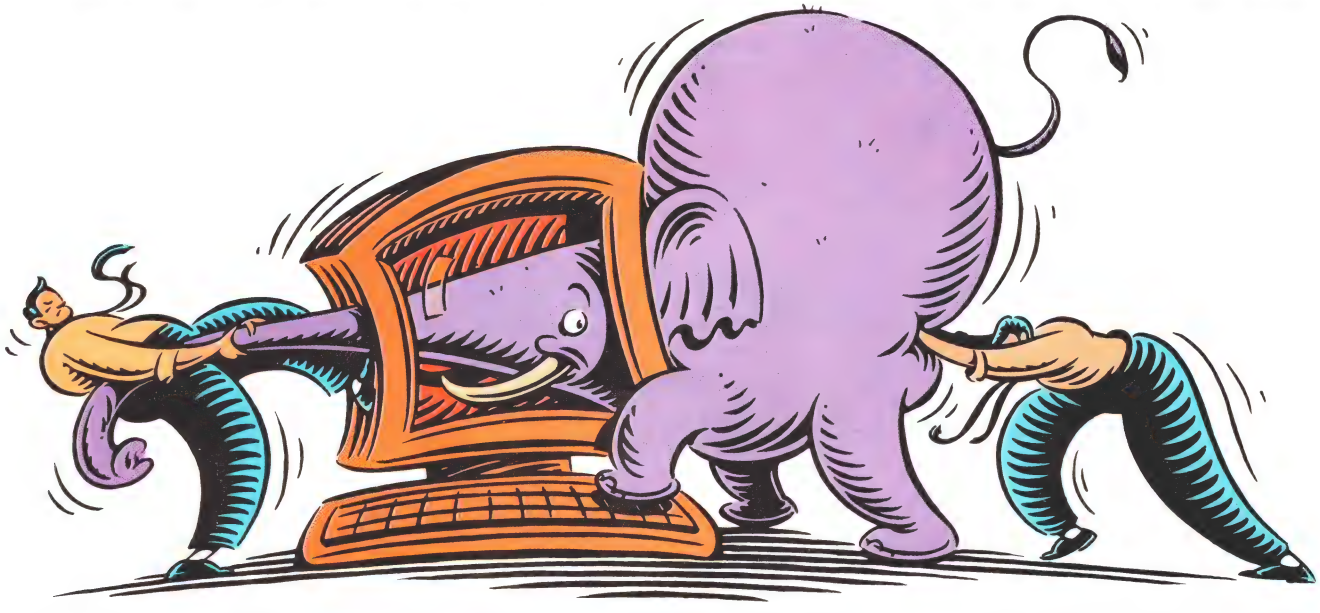
There's An Easier Way To Get More Memory Into Your Computer



If you've been struggling to get the most out of your PC's memory, there's an easier way. It's called NETROOM – the award winning memory manager that uses the newest technologies to shatter memory barriers, giving you more memory and a faster system.

CRASH-PROOF

With *"Customize"*, NETROOM's crash-proof installation utility, you can configure all of NETROOM's features automatically – just type one command and you're done! Even if you turn off your system in the middle, when you turn it back on *"Customize"* will pick up where it left off. Of course, you can always customize *"Customize"* if you like.

But there's more to memory management than just easy installation. NETROOM includes our revolutionary *"Cloaking"* technology – a technique that allows DOS drivers and TSRs to run in extended memory as if they were running under Microsoft Windows™. *Even if you never run Windows!* If you do use Windows, you'll find our cloaked utilities fully Windows-compatible.

NETROOM provides a cloaked system BIOS for all compatible systems including ISA, EISA, MCA and Laptops. NETROOM's cloaked BIOS is designed to run in the "protected mode" of your 386/486 family processor. This makes it safer to use. The cloaked BIOS also takes full advantage of the 32-bit power of your computer so it runs faster. And it doesn't occupy any DOS memory, so you save up to 96K. Think of it as a *free* BIOS upgrade that saves memory and makes your system run faster.

YOUR "FLU" SHOT IS BUILT IN

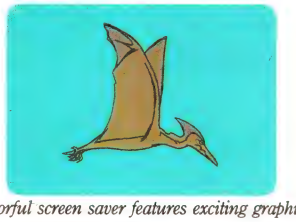
In NETROOM, virus protection is integral to the cloaked BIOS. It detects when a virus or errant program tries to get at the most vital parts of your hard disk and prevents the damage before it begins. Our cloaked BIOS even stops attempts to destroy your data by reformatting your hard disk.

LIGHTNING SPEED

To really soup - up your system, NETROOM includes a cloaked Disk Cache which occupies only 5K of DOS memory, but runs faster than any other cache. That's because our cloaking technology unleashes the 32-bit power of your system. And, NETROOM provides a cloaked text-mode screen accelerator that makes your screen run up to 20 times faster!

SOME PRETTY SHARP TOOLS

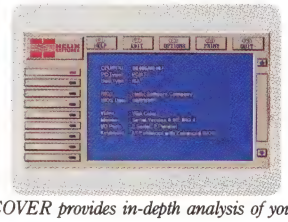
NETROOM is packed with other utilities as well. A cloaked graphical Screen Saver protects your screen from burn-in. A cloaked RAM disk lets you set up the world's largest RAM drive – up to 256Mb. And, cloaked DPMI support provides compatibility with the latest applications.



Colorful screen saver features exciting graphics

SYSTEM REQUIREMENTS: Netroom operates with any 386 or 486 system with at least 1Mb of RAM. Limited support for 286/Neat systems is provided but does not include "Cloaking". For Windows support Netroom requires Windows 3.1 or later (WFW is supported). Microsoft Windows is a trademark of Microsoft Corp.

We topped it all off with our enhanced DISCOVER™ system utility which now sports a snazzy and more easy-to-use graphical interface.



DISCOVER provides in-depth analysis of your PC

SOME TECHNICALITIES

NETROOM supports pooled EMS and XMS memory, all the industry standard specs: EMS 3.2 and 4.0, XMS 3.0, VCPI, EEMS, VDS. NETROOM provides DOS-compatible UMBs and HMA. NETROOM loads FILES, BUFFERS, FCBs and COMMAND.COM high, and manages self-high-loading TSRs and drivers and ROM shadowing and de-shadowing.

NETWORK USERS...

With remote installation, special network support and the lowest cost and most flexible multi-user licensing available, NETROOM has always been the undisputed best choice for corporate and network users. And now, with the power of cloaking and the ease of our new setup utlity, NETROOM is the clear choice for you.

NETROOM... it's like getting an elephant's memory into your PC with a push of a button... for peanuts!

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Circle 90 on reader service card

PC Support Gets Simple: Whatever You Want

The first thing you notice about the service and support plans of major PC makers is how heavily the ifs, ands, and buts weigh in. IBM gives you three years of on-site service—even boasting a 4-hour turnaround—but only on some PS/2s, not ValuePoints, PS/1s, or notebooks. And if your Model 95 was purchased before a certain date, it carries only a year of on-site. Compaq advertises a three-year warranty on everything . . . but printers. Dell has one program for its high-end PCs, another for Dimensions, another for PCs bought through discount stores.

Have It Your Way

Confusing? Yes, but a big improvement over the tell-it-to-your-dealer policies of days past. And things get a lot better from here on. PC warranties have begun to metamorphose into a simple statement of support wherever and whenever you need it.

The transformation won't happen tomorrow. But at least the largest vendors now clearly agree with Dell that service is a terrific way to stand out in a same-same pricing environment—especially if you build 'em right in the first place. And service matters to users: Note the spike in PS/2 sales after IBM's new warranty. Reason enough for Compaq to up its warranty to three years and phone support to seven days a week, 24 hours a day. AST, Dell, and other first-tier competitors have unannounced plans to follow IBM and Compaq to the 7/24 plan and improve on-site policies as well. Everyone is drafting three-year, on-site contingency plans.

The majors figure new technology will let them deliver higher levels of service while actually lowering some costs and avoiding others. The cost they most want to avoid is the $100 to $200 dropped for the average on-site service request. The precise figure has less to do with the repair itself than the number of trips a repair technician makes.

To minimize road trips, large vendors are building expert systems to help technicians resolve most problems over the phone. Smart phone systems are routing calls faster, saving staff and phone charges. Databases detailing precise configuration and repair histories of PCs are becoming de rigueur.

These measures wouldn't do much for your car or VCR. But your PC has on-board intelligence and almost no moving parts. The most complex repair is a component swap. On those occasions when a swap is necessary (about 1 percent of the time), vendors want a technician to walk in with a precise diagnosis and a "hero kit" of the right replacement parts.

Compaq's *RemotePAQ* software lets support personnel audit a modem-equipped PC and diagnose its problems anywhere a phone will reach, any time that's convenient for you.

If your WIN.INI just needs to be reconfigured or your BIOS is out of date, a technician can download a fix over the phone. When digital signal processors become commonplace, it will be feasible to download even large bundles of software or technical manuals such as the CD ROM–based *Quick-Find* reference library from Compaq.

Do It Yourself

Who'd want a technical manual? Vendors hope you will—or, at least, highly graphical repair charts. The fastest and cheapest way to service your PC is to do it yourself (DIY). It's no big deal once you know the problem. The occasional part failure could be diagnosed by phone and replaced by you from a drop-shipped hero kit. To that end, Dell has combined its new snap-together L chassis with a phone line and cash incentives for DIYers.

Vendors will match service offerings to the needs and budgets of different customer groups. Joe Bob's PC-O-Rama may not offer much, but name brands can afford a wide selection. You already get a "lifetime" of telephone support from Dell, and why not? Most PC problems occur in the first 90 days, after which PCs are more likely to be replaced than break.

The warranty scenario may be confusing today, but tomorrow it will be simple: a "lifetime" of PC security.

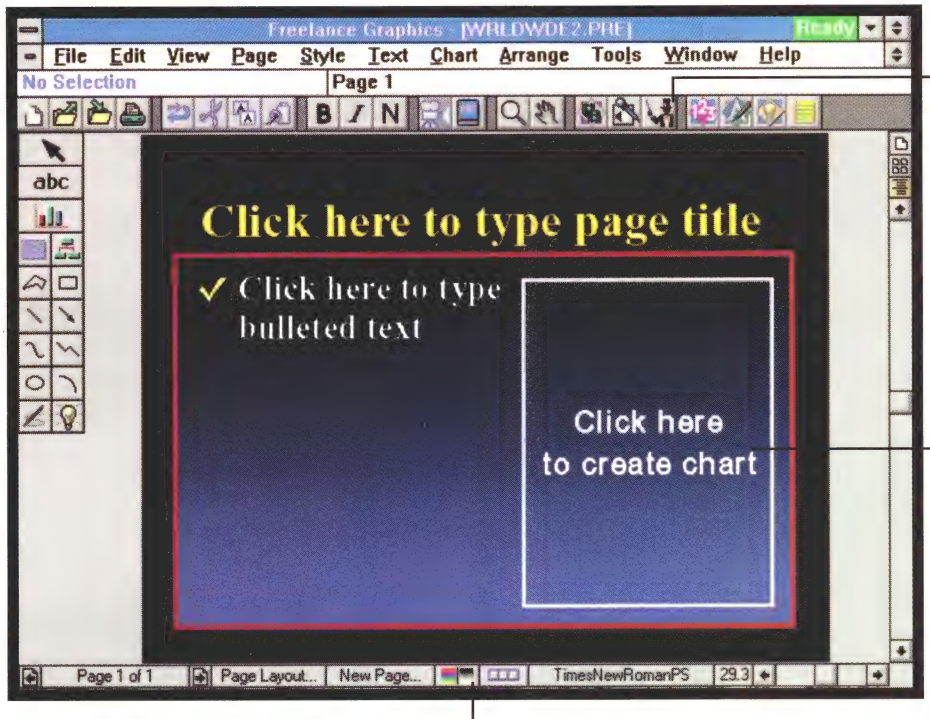
By Mike Hogan

WHAT TO WATCH

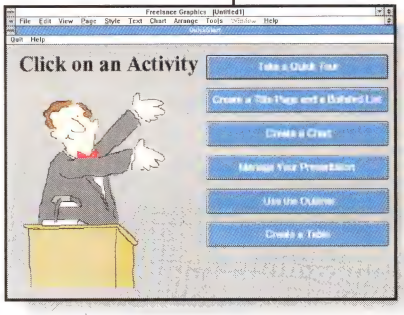
Canon is rumored to be planning a novel product in mid-April; a lightweight, full-featured notebook with an ink jet printer/plain-paper fax . . . . By the end of March, AST's Advantage Net small-business computers will come preconfigured with a radio-based, peer-to-peer LAN and Microsoft Windows for Workgroups at $2000 to $3500, depending upon configuration . . . . The monochrome version of Zenith Data Systems' 3.3-volt Z-Note 486SL Series notebooks will reportedly yield 4½ hours of uninterrupted, full-power operation, while both active and passive color versions yield 2½ hours each . . . . Version 1.5 of XTree for Windows brings you fast and flexible program launching, extensive file management capabilities, and support for Windows for Workgroups networking for under $70 . . . . In March, Symantec untangles Windows' communications interrupt mishandling with its under-$180 Norton pcAnywhere for Windows, which will let you control a remote PC across town, across the country, or across your network and chat in a scrollable window.

PHOTO: MICHAEL LLEWELLYN; ILLUSTRATION: JEFF BERLIN

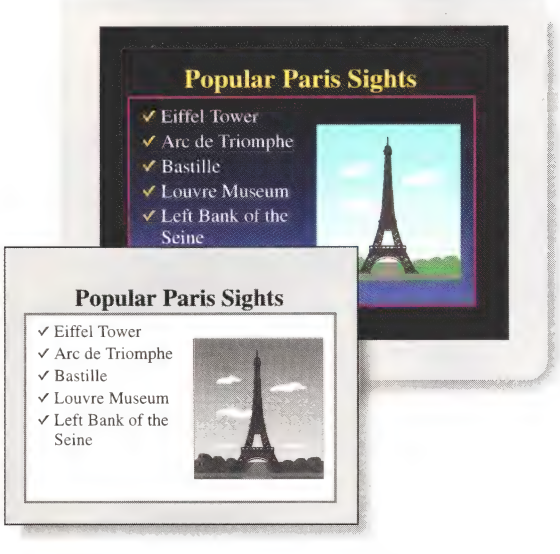
New Freelance Graphics 2
(Especially the decision t



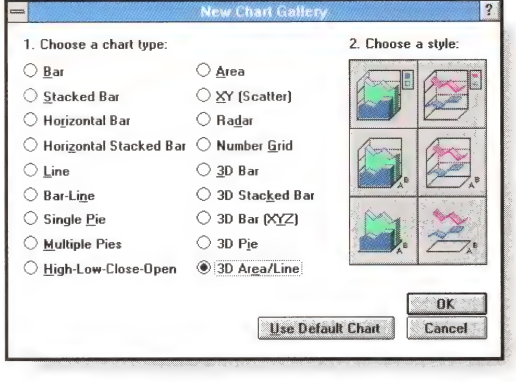
Single-click access to powerful presentation tools makes Freelance Graphics easy to use.



Just click to view the animated QuickStart tutorial. It walks you through your first presentation in under 30 minutes.



Just click to instantly see your presentation in color or B/W. It's automatically optimized for printing both.



Just click to browse through a gallery of 108 ready-to-go chart styles including new 3-D line, 3-D area and radar selections.

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Introducing Freelance Graphics For Windows,™ Release 2.0.

The first release of Freelance Graphics™ won every major award in the presentation graphics category in 1992. And users agreed in two recent studies by the Usability Sciences Corporation that Freelance Graphics was easier to use than Harvard Graphics for Windows or Microsoft® Powerpoint® 3.0.

Now, in Release 2.0, we've built on the innovations of the first release, adding many ease-of-use enhancements and exciting new capabilities. And we subjected every enhancement to rigorous usability testing. The result is the fastest, friendliest, and most intuitive presentation software available today.

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PC Computing MVP 92 WINNER ™

Release 2.0 has already won PC Computing's coveted MVP Award.

If You're Using Harvard Graphics, Make The Switch Now.

Call **1-800-872-3387, ext. 8375** to reserve your free, full-featured working model, available in early March, and ask about our special competitive upgrade price. And remember that Freelance Graphics is included in Lotus® SmartSuite:™ four award-winning Windows applications at a great price.

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DOS 6: MORE UTILITY,

PC users are a finicky lot. For years software vendors tried to tempt them with utility products designed to compensate for DOS's shortcomings. Some vendors tried the smorgasbord approach, offering packages with everything from disk optimizers to communications programs. Others tried the steak tartare approach, creating products that featured intimidating bit-level disk editors and bare-bones interfaces requiring arcane command switches. Some even tried the red herring approach, slipping the utilities into DOS and *Windows* shell products. Though all of the products were well received by reviewers, few users bought them. Rod Turner, executive vice president for Symantec's Peter Norton Group, estimates that fewer than 5 percent of all PC users own utilities products.

Now it looks as if Microsoft has a recipe that may satisfy all but the most demanding users: DOS 6.0, slated for release in April, incorporates numerous improvements over its predecessor in the form of basic utilities previously available at extra cost from third-party vendors. The DOS 6.0 offerings include on-the-fly data compression, virus protection, backup, and basic networking. "Available at no extra cost" may be the key ingredient here. The utility products included in the beta version we tried were solid and easy to use. Several of the programs were scaled-down versions licensed from Central Point Software and Symantec. Though Microsoft readily admits that full-fledged products from third-party vendors can do some jobs more thoroughly, the more complete products don't include the operating system, which users must buy anyway.

"We focused on adding things that would appeal to a broad range of users."

–Richard Freedman, Microsoft

PHOTO: MATTHEW MCVAY

How DOS 6.0 Does It Better

Microsoft's DOS 6.0 offers a wealth of valuable features

Hard disk utilities
On-the-fly disk compression • Disk defragmentation based on technology culled from Speed Disk, part of Symantec's *Norton Utilities*

Data preservation
Backup (*Windows* and DOS versions) based on Symantec's *Norton Backup* • Antivirus feature (*Windows* and DOS versions) based on Central Point Software's *Anti-Virus*

Memory management
Easy-to-use, automatic memory optimizer

Communications
Network feature for accessing files, peripherals on other PCs with compatible software • E-mail program compatible with *MS Mail* and *Windows for Workgroups* • File sharing utility for exchanging files with another PC or portable

Ease of use
On-line help • An improved installation feature handles thorny tasks such as setting up SMARTDRV disk cache

System startup
"Clean boot" bypasses CONFIG.SYS and AUTOEXEC.BAT • Multiple configurations

New DOS commands
MOVE for moving files • DELTREE quick command for deleting directory, its contents, and its subdirectories

Edited by Russell Glitman

MORE POWER

Like DOS 5.0, this version will be available as an upgrade. John Dunkle, president of WorkGroup Technologies, expects it to sell at approximately $60 on the street, about $10 more than DOS 5.0. He estimates that buying utilities similar to those offered in DOS 6.0 from third-party vendors would cost about $800. As a result, the product could outsell DOS 5.0, Microsoft's most successful DOS version to date, by 15 percent, Dunkle said.

How DOS 6.0 will affect third-party utility vendors is unclear. Once users sample a scaled-down version of, say, the backup program, they want a more robust third-party package, said Richard Freedman, MS-DOS product manager at Microsoft. Both Symantec and Central Point Software agree with Freedman and anticipate that brisk sales of DOS 6.0 will lead to increased sales of their utilities. For more sophisticated users this might be the case. But DOS 6.0 is intended for the average home or business user and could satisfy most of their needs. "If [the operating system] includes all these features, there's no reason to buy them from somebody else," Dunkle said.

Data Compression

DOS 6.0 includes DoubleSpace, a data compression program that may be one of the better ones around. Like the front runners, Stac Electronics' *Stacker* and AddStor's *SuperStor Pro*, DoubleSpace is fast, virtually transparent to the user, and claims to double hard disk capacity. The product compresses data automatically as it is stored and decompresses it when it is retrieved.

But Microsoft says the similarities end there. *Stacker* and *SuperStor* work outside the operating system; therefore, DOS loads them from commands installed in your CONFIG.SYS and AUTOEXEC.BAT files. If those files are accidentally erased or modified, the system may need to be reconfigured and rebooted.

Microsoft says DoubleSpace is a little more bombproof. Because it is a part of the operating system, changes to configuration files shouldn't affect compression. Moreover, DBLSPACE.BIN and its two associated files are hidden system files—accidental deletions become virtually impossible.

DoubleSpace offers some other nice features too. The program lets you increase or

PHOTO: RICHARD HOWARD; ILLUSTRATION: MICHAEL BARTALOS

If DOS 6.0 "includes all these features, there's no reason to buy them from somebody else."

–John Dunkle, WorkGroup Technologies

News Monitor

RING THE BELL: Aiming to attract first-time PC purchasers and upgrade-conscious veterans alike, Packard Bell's new line of 486s features flexibility and ease of use. The product line comes in 68 varieties; processors range from a 25-MHz 486SX to a 66-MHz 486DX2, hard disks start at 107MB, and case options include a four-slot, four-bay desktop, a three/three small profile, and a five/five minitower. However, the linchpin of the systems' performance and flexibility is Power Pack, which includes a proprietary local bus video graphics accelerator, a ZIF socket for simple installation of OverDrive processor upgrades, and the ability to add as much as 512K of cache memory, to double video memory to 1MB, and to bring system RAM up to 32MB. With bundled software, the systems cost between $1099 and $3999 and include one-year limited warranties and on-site service.

SOFTWARE PRICE WAR: Borland officials say they are not reacting to the phenomenal sales of Microsoft's *Windows* database, *Access*, but until April 30 you can buy Borland's just-released *Paradox for Windows* database for $139.95—regular list is $795. The company is also reintroducing its *Quattro Pro for Windows* spreadsheet for $99.95 through the end of April. List is $495, with a money-back guarantee.

The price deals follow layoffs and restructuring at Borland aimed at building market share in the wake of the success of *Access*, which despite bugs is expected to sell 750,000

(continued on page 53)

Continued from page 51

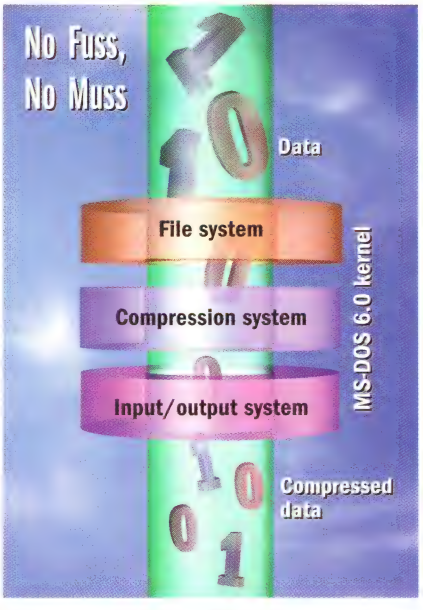
decrease the amount of compressed space on your disk, and Microsoft claims that DoubleSpace can convert files compressed with *Stacker* to its own format.

Disk Maintenance and Data Protection

DOS 6.0 offers a defragmenting utility, which is a subset of *Norton Utilities'* Speed Disk licensed from Symantec. The DOS 6.0 product rearranges the free space on the uncompressed portion of your hard disk to improve disk performance. (A defragging utility developed by Microsoft performs similar functions on compressed disk sectors.) Power users seeking maximum performance will still want a full-blown defragger like Speed Disk, which rearranges splintered files as well as free space.

The backup utility, also licensed from Symantec, is a scaled-down version of *Norton Backup*. The product offers basic functions, such as error correction and file comparison, and lets you choose full or partial backups. Corporations or advanced users may opt for a full-blown backup product: The DOS version doesn't support scheduled backups or tape drives.

An antivirus utility, licensed from Central Point Software, also offers basic features. The product scans both memory and disks for known viruses, checks for unknown viruses, and offers access to antivirus updates from Central Point. Again, corporate users may want a full-blown product designed for network use.



DOS 6.0 INVISIBLY INCREASES the effective capacity of your hard disk or floppy.

Although DOS 5.0 offered improved memory management features, optimizing memory was still tricky. The MemMaker program in 6.0 automates memory optimization. When you invoke the program, it examines your system, makes an educated guess at where to move device drivers and memory resident programs in upper memory, modifies setup files accordingly, and reboots. If the system hangs, the program takes over and offers several options to reconfigure it. Microsoft claims the product can free up as much as 100K more RAM than the memory manager in DOS 5.0.

DOS 6.0 also has some new communications features. Built-in network-client software lets a DOS 6.0 PC access files and peripherals from PCs running *Windows for Workgroups*, Windows NT, *LAN Manager*, or a compatible network. An E-mail feature lets you communicate with PCs configured as *MS Mail* or *Windows for Workgroups* post offices. DOS 6.0's file sharing utility lets you transfer data via parallel or serial ports between two computers. Other smaller improvements abound, including new DOS commands, better on-line help, and easier installation. Bon appetit.

—Randy Ross

SL Transformed:

You'll probably see small-footprint, power-efficient desktops from a wider variety of vendors sooner rather than later, as a result of Intel's decision to bring all appropriate features of its 486SL into future versions of the 486SX, 486DX, and 486DX2 processors. But Intel denies industry reports that the move means the elimination of its mobile processor family.

"The 486SL has not been canceled, nixed, waxed, or iced," claims 486SL product marketing manager Dave Ryan. He insists that despite reports to the contrary, Intel will introduce 25 flavors of mobile processors in 1993, including a 33-MHz 486SL by the end of March.

But by 1994, new versions of so-called desktop families will gain the power-saving features of the SL line—3.3-volt rather than 5-volt operation and both static mode and system management mode (SMM), so that inactive components, subsystems, or the entire machine can be powered down to 0 MHz.

That leaves some people, like Texas Instruments marketing communications manager Jerry Rycaj, asking why a special SL line existed in the first place. "We never bought the SL story," he says, "because we couldn't prove that we could do better going the SL route than with SX and DX chips using our own power management."

The name of the processor inside their systems makes little difference to users anyway, notes Marcy Puhnaty, AST's portable product manager. But SL features do. The migration of those features to desktops will advance the introduction of so-called green PCs, which use considerably less power and generate less heat. These systems will have smaller, more integrated motherboards driven by power plants that could be two-thirds smaller than today's, creating smaller desktops that are cheaper to buy and run.

Intel's off-the-shelf solution can eliminate much, but not all, design duplication among vendors, adds the executive of another large portable systems maker. So green PCs may arrive sooner at more price points and from more vendors—even small suppliers without their own custom power management.

SL Moves to Desktops

BENEFITS

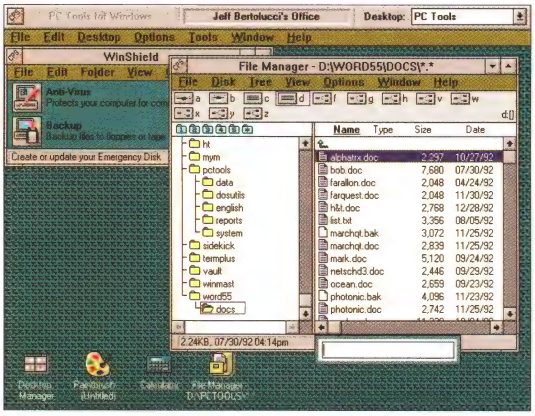
- Reduce cost of operation
- Cut component costs
- Conserve natural resources
- Require smaller power supplies
- Provide cooler operation
- Reduce fan noise
- Prolong system life
- Permit smaller motherboards
- Reduce desktop PC footprint

DRAWBACKS

- None

JEFF BERLIN

PC Tools Comes to Windows



PC TOOLS FOR WINDOWS' File Manager lets you drag a file to the Anti-Virus window for a quick virus scan.

TEST DRIVE Long a popular DOS package for protecting and recovering data, monitoring and optimizing system performance, launching programs, and automating tasks, Central Point Software's *PC Tools* is making an impressive *Windows* debut with the usual slew of utilities, plus a nifty *Windows* shell that replaces the much-maligned Program Manager.

Like Symantec's *Norton Desktop for Windows*, Hewlett-Packard's *NewWave*, and a growing list of other third-party *Windows* shells, *PC Tools'* Desktop replaces the rigid program groups of *Windows'* Program Manager and adds a few Mac-like touches. You can arrange programs and files in related groups called folders and put folders inside folders. For example, your projects folder might contain a presentations folder, within which might be yet another folder containing an *Ami Pro* document, an *Excel* spreadsheet, and a *CorelDraw* chart—all pertaining to a single business presentation.

PC Tools for Windows has its own File Manager, which offers a few bells and whistles you won't find in the standard *Windows* issue. A key addition is the product's easy-to-use compression feature. To compress a file, you just drag it from its current directory to the compressed file directory in the File Manager tree. You can view the contents of a compressed file without expanding it first. Sophisticated drag-and-drop capabilities let you drag drives, directories, and files out of *PC Tools'* File Manager to other applications, and vice versa.

As you'd expect, *PC Tools for Windows* offers all the helpful utilities of its DOS counterpart, including an integrated copy of *Central Point Backup* that lets you back up an entire disk, specific directories and files, or only the files that have changed since your last backup. You can create a DOS Emergency floppy disk to boot your PC in case you have hard drive problems, and *PC Tools'* DiskFix utility can analyze and repair the hard drive—protecting you against damaged file allocation tables and directory structures that can cause data loss.

The program includes *Central Point Anti-Virus*, claimed to protect your system against more than 1500 viruses (quarterly updates are available). You can schedule unattended virus scans and drag and drop files from File Manager to the *Anti-Virus* window for a quick scan. A scheduler, data encryption, and a file finding utility are just a few of the other tools. Pricing was not set at press time but was expected to be similar to that of *PC Tools 8.0* for DOS, which lists for $179, $69.95 for upgrades.

—Jeff Bertolucci

PC Tools for Windows

WINDOWS **The new Windows version of this feature-packed utility lets you customize your desktop to suit the way you work.**

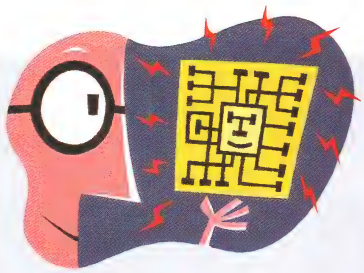
Key Features: Customizable Windows shell • Improved File Manager • Compression • Backup and antivirus utilities

Pricing: Not set at price time

Availability: Spring 1993

Central Point Software, 800/445-4208, 503/690-8090

Reader service no. 833



News Monitor

(continued from page 51)

copies during its 90-day promotional drive (slated to end January 31), compared with last year's total PC database sales of just 1.25 million.

After announcing the layoffs, Borland's Philippe Kahn predicted 1993 would be a year of price wars: "The price of software on *Windows* and DOS is going down. We didn't start that."

BACKATCHA MICROSOFT: Recovering from Microsoft's *Windows for Workgroups* incursion, peer-to-peer networking leaders Artisoft and Novell began their counterattack this month. Artisoft is parrying Microsoft's *WorkGroups* thrust with channel programs and discounts that aid its 15,000 active *LANtastic* resellers. Meanwhile, Novell is trying to leverage its more robust net management facilities—both with special emphasis on corporate users.

Already compatible with *Windows* applications, *NetWare Lite 1.1* has just gained a new *Windows* interface that provides access to the NOS's considerable network management facilities for directory services and multilevel security. Similarly, Artisoft has a new ethernet adapter card, the NodeRunner, bearing a chip of its own design that simplifies net configuration and enhances performance. Both products support more platforms than *Windows for Workgroups*.

NOVELL'S ANSWER TO NT: Trying to gain the upper hand against Microsoft in the looming battle of the network operating systems, Novell intends to

(continued on page 55)

ILLUSTRATION: MICHAEL BARTALOS

A Trio of ASTs Pushes the Limits

Okay, you've been reading about faster PCs since Blue got Big, but AST's new Premmia trio is proof that speed thrills. The line offers a selection of today's fastest processors, local bus graphics, the fastest I/O available, plenty of disk capacity and memory, and prices below what you pay for the Power Premium line it replaces. And Premmia is a Pentium placeholder—any of the three systems is ready for a quick upgrade to Intel's newest engine.

In days gone by, you could argue that only users with the most expansive applications and budgets needed cutting-edge power. Then came that great equalizer *Windows* to put a strain on everyone's computing. There's no longer any real reason to forgo PC power when you can get the 486SX-33–based Premmia 4/33s with 8MB of RAM expandable to 128MB, a 170MB IDE hard drive, factory-installed DOS 5.0 and *Windows 3.1*, and a PS/2-compatible mouse for a list price of about $2000. Add the standard 14-inch color super-VGA monitor, and that probably ends up being your street price. Similarly configured Premmia 4/33 and 4/66d models—driven by Intel's 486DX-33 and 486DX2-66 processors, respectively—will be available for about $2500 to $4000.

Local Bus Graphics

All Premmias are designed to be state-of-the-art graphics performers and feature the AST LocalLink graphics subsystem with local bus video via ATI's 68000 chip. Transfers between the graphics subsystem, memory, and CPU take place at processor speed along a 32-bit bus. The chip also provides fast bit-block transfers for snappy screen updates, a hardware cursor for smoother zooming and panning, and hardware line draw for enhanced CAD and other draw functions.

The systems come with 1MB of video DRAM supporting 16.8 million colors at 640 by 480; 65,536 colors at 800 by 600; and 256 colors at 1024 by 768, all noninterlaced. Add another megabyte, and you gain speed via 64-bit bit video I/O and a 256-color 1280-by-1024 (interlaced) video mode.

Speaking of upgradability, a unique connector on the Premmia motherboard accepts various AST "personality" modules—ethernet, business audio, token ring, or SCSI—without wasting one of five EISA expansion slots. The ethernet module is available now, with the others a month or two down the road.

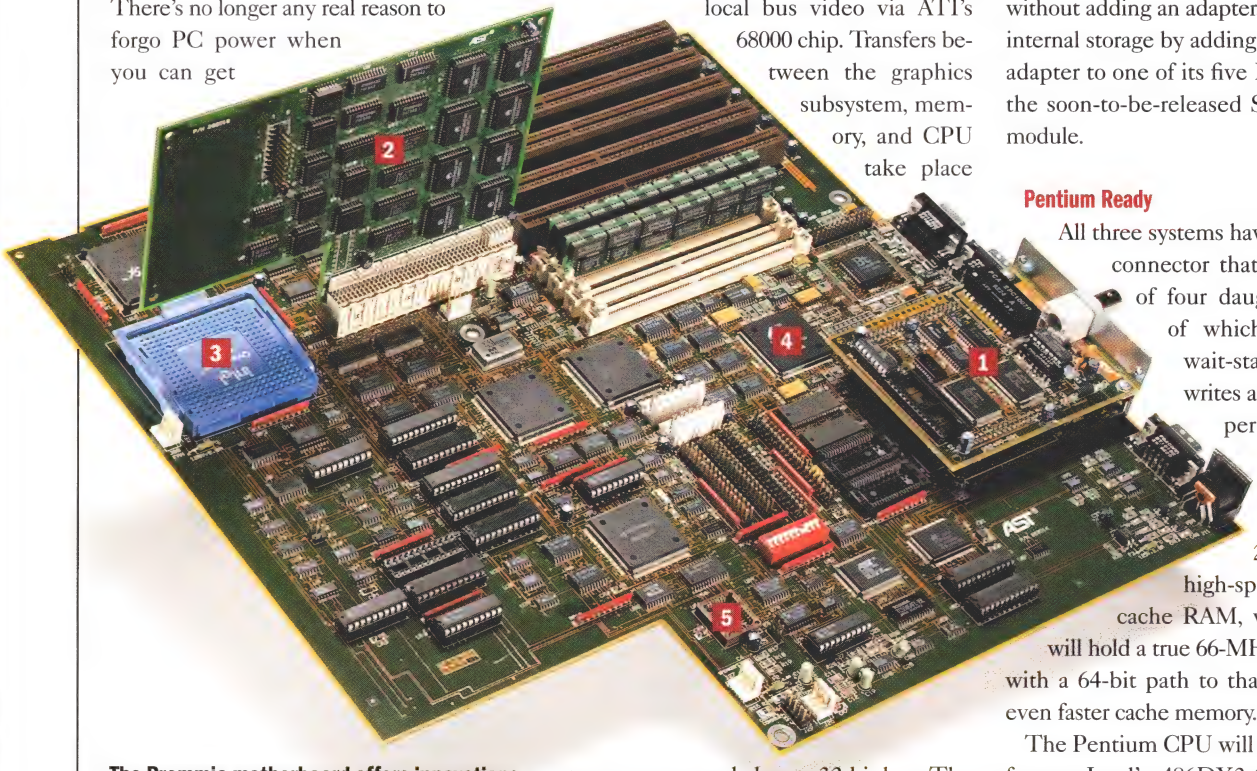
With three external and two internal drive bays, you can add two floppy devices and a tape drive and still boost any of the Premmias to more than 1GB of IDE storage without adding an adapter. Achieve 2GB of internal storage by adding AST's FastSCSI adapter to one of its five EISA slots or via the soon-to-be-released SCSI personality module.

Pentium Ready

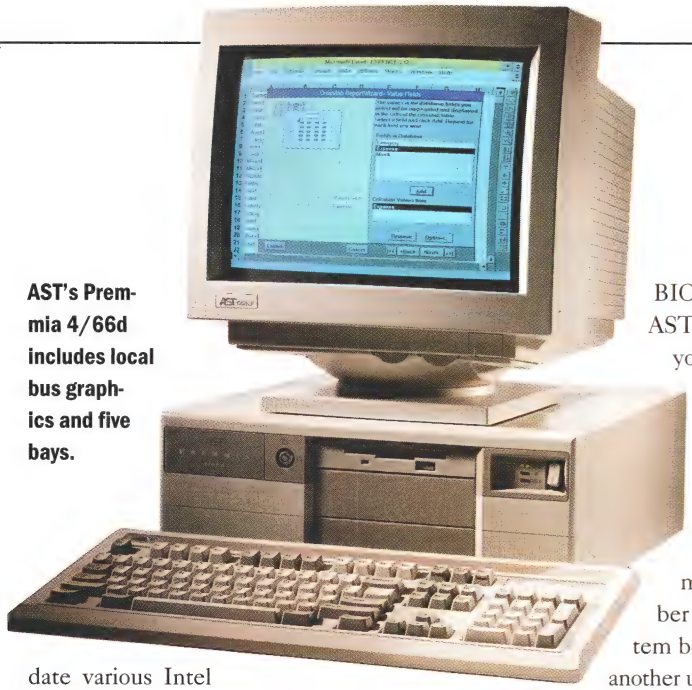
All three systems have a motherboard connector that's ready for one of four daughtercards, each of which ensures zero-wait-state reads and writes and boosts system performance even further. Three of the cards provide 128K, 256K, or 512K of high-speed synchronous cache RAM, while the fourth will hold a true 66-MHz Pentium CPU with a 64-bit path to that card's 256K of even faster cache memory.

The Pentium CPU will perform twice as fast as Intel's 486DX2-66 and can use today's software without recompiling. However, recompiled software will be able to take full advantage of the Pentium's dual cache/dual integer processing scheme and run faster still.

All of the Premmias sport a 238-pin ZIF (zero-insertion force) socket to accommo-



The Premmia motherboard offers innovations including (1) personality modules for adding ethernet, token ring, audio, or SCSI; (2) daughtercard for additional cache or a Pentium upgrade; (3) OverDrive socket; (4) local bus videc with AST's LocalLink graphics subsystem using ATI's 68000 chip; and (5) an updatable flash BIOS.



AST's Premmia 4/66d includes local bus graphics and five bays.

date various Intel OverDrive processors, including the Pentium-based OverDrive for DX2, which probably won't appear until year-end.

All this is packed into the same diminutive 15.5 by 16.5 by 6.25-inch case that AST introduced with the Power Premiums. But the Premmias are equipped with the prime heat-mitigating features needed for future Pentium upgrades—a 200-watt power supply to drive the 3 million–transistor chip and room for a second fan. Another innovation is baffled-board holders that let heat blow out the back of the system.

BIOS Plus

BIOS (basic input/output system) is one of those under-the-hood features due to play a greater role in automatic peripheral configuration and other PC control functions in years ahead. With AST's FlashBIOS, which can be updated in minutes with the latest BIOS downloaded from AST's bulletin board, you'll be ready for whatever comes.

FlashBIOS also is equipped with interesting asset-control and security features. The machine's serial number is stored in the system before shipment, and another user-definable field of 25 characters lets you add configuration and asset control codes of your own so that, say, an information manager could inventory AST system configurations—even remotely over a network.

There is, of course, a boot-up password, the floppy drives and parallel port can be made read-only, and after a user-determined period of inactivity, FlashBIOS's Walk-n-Lock feature will require a password to return the system to operation. A network administrator password configuration "lock" and a front-mounted chassis lock provide additional security.

AST offers a one-year on-site/three-year depot service warranty and 24-hour phone support seven days a week. With the Premmia, you have proof that getting out on the edge of technology can be a no-pain, plenty-of-gain proposition.

—Mike Hogan

Premmia 4/66d, 4/33, 4/33s

AST's new Premmia trio delivers more of the fast, faster, and fastest processing you'll need to keep up with today's graphical computing.

Key Features: **Easy upgrade to the Pentium processor • Local bus graphics with built-in BitBLt, hardware cursor, line draw, and 1MB video RAM • Five available 32-bit EISA expansion slots, five drive bays • High-resolution 14-inch or 17-inch color monitor • Small footprint (15.5 by 16.5 inches)**

Pricing: **Expected to range from $2000 for Premmia 4/33s to $4000 for Premmia 4/66d; monitors are $495 for 14-inch and $1095 for 17-inch, both low radiation**

Availability: **Immediate**

AST Research, 800/876-4278, 714/727-4141, 714/727-9355(fax)

Reader service no. 834

News Monitor

(continued from page 53)

improve integration of NetWare and UNIX in 1993. (In January Novell announced plans to purchase UNIX Systems Labs [USL] from AT&T for $350 million.) According to Novell and USL officials, work is under way to develop a common application programming interface—allowing developers to write programs to both NetWare and UNIX—and shared systems administration and data security features.

HOME OFFICE DEDUCTION: A recent Supreme Court ruling will make it tougher for some people to deduct home office expenses, including PCs, from their taxes. The ruling affects those who do some work at home but spend the bulk of their work time at other locations. Examples include self-employed individuals, such as physicians and consultants, who use an office for administrative work, such as billing and correspondence, but spend most of their time seeing clients away from home. In the Supreme Court case, a self-employed Virginia physician used a spare bedroom in his home for administrative tasks. The court ruled that because he spent most of his time seeing patients at area hospitals, not working at home, he couldn't claim the bedroom as a home office. The upshot: the IRS will now look more closely at the amount of time spent and the relative importance of activities performed in a home office, said Lawrence W. Goldstein, a senior tax manager at the accounting firm Ernst & Young.

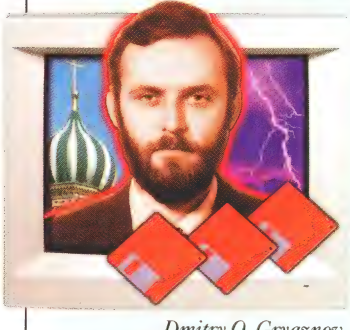
—Jeff Bertolucci, Russell Glitman, Mike Hogan, Richard Melville, Randy Ross

From Russia With Love?

The Cold War is no more—or is it? International security experts will assemble from March 10 through 12 in Manhattan to discuss a new silent threat from the Eastern bloc: computer viruses.

At the Sixth International Computer Security & Virus Conference & Expo, scientists from Russia and Bulgaria—two well-known virus hotbeds—are scheduled to speak. How great is the threat? No one can say, but reports have one Bulgarian virus outbreak costing Germany some 10 million deutsche marks.

Dmitry O. Gryaznov of the Russian Academy of Sciences, a scheduled speaker at the conference, says social forces make Russia and Bulgaria ideal virus cultures. Although Russian students learn programming, no market for their skills exists because of what Gryaznov calls the "Russian computer antiethic"—software piracy is not only legal but encouraged. Viruses offer Russian youths a creative challenge.



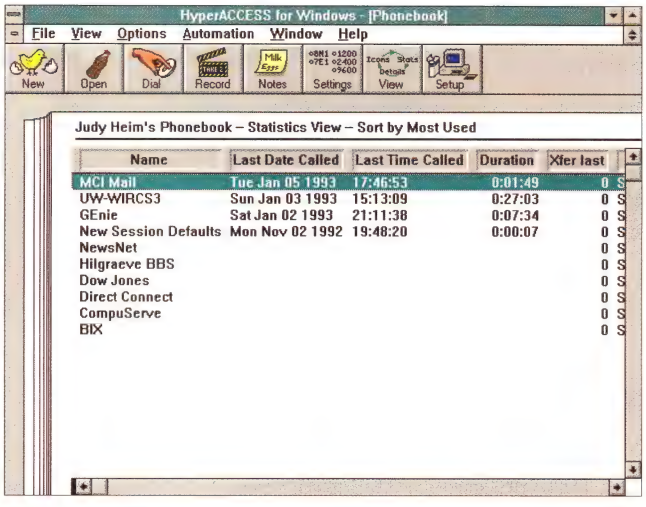
Dmitry O. Gryaznov

For more information on the conference, contact the Sixth International Computer Security and Virus Conference, 800/835-2246 ext. 190.

A Complete Windows Communicator

TEST DRIVE What does Hilgraeve's *HyperAccess for Windows 1.0* offer that can't be found in *Procomm for Windows*, *Crosstalk for Windows*, *MicroCourier*, and all the other *Windows* communications programs? Try pop-up, context-sensitive mini-menus, a smart scrollback buffer, built-in virus protection, and the ability to create individual icons and documents for each on-line system you call.

Open the program, and you'll spot icons of chicks hatching, bottles of soda fizzing, and file folders winging through the air. Already you know that on-line sessions are not going to be dull. Delve deeper, and you'll find some nifty innovations too, like the Keys & Buttons dialog box, which lets you create keys or icons for passwords, on-line functions, or external programs.



HYPERACCESS FOR WINDOWS is organized around a central dialing directory. Scroll downwards or sideways to check settings.

Scrollback Buffer

A scrollback buffer with long-term memory stores the dialog of any on-line session. When you dial a service, *HyperAccess* loads the dialog of your previous session. If you've ever spent 20 minutes typing an E-mail message, then lost the on-line connection and spent the next half hour trying to retrieve the message from the scrollback buffer and get it back on line (usually you can't), you know how priceless this feature is.

You can use the mouse to pop up context-sensitive menus for any operation. Or you can customize your mouse-clicks to send selected words or letters from your screen to the host—useful for automating commands. A Launchpad editor lets you cut and paste text between incoming and outgoing E-mail messages. The program's virus filter scans for more than 300 known viruses in downloads, even files compressed with *PKZIP*. Should it encounter a virus, a pop-up message gives warning and lets you abort the transfer if you wish.

But genius never comes without quirks, and *HyperAccess for Windows 1.0* is a case in point. The icon bar is austere as far as *Windows* communications programs go. It includes icons for adding a phone book entry (the chick), opening an entry (the soda bottle), dialing a number, recording a script, and other basics. Absent are clipboard or printer icons. Once you get on line, you won't find any of the special on-screen buttons or function keys that other *Windows* communications programs feature. And although you can drag and drop files from the File Manager to upload them, you need to write a C program to do this.

HyperAccess is a highly customizable program, with a million levers. Almost everything can be turned on or off, but finding the right setting can be hard if you're used to other communications programs, and some icons require more than a second's thought to identify.

HyperAccess for Windows is hardly intuitive, so it takes some getting used to. But it is worth the trouble.

—Judy Heim

HyperAccess for Windows 1.0

WINDOWS **Although hardly intuitive, this communications program offers so many features that it's hard to complain.**

Key Features: **Easy programming of buttons • Scrollback buffer with memory • Supports scripts written in C • Multiple sessions**

Pricing: **$199**

Availability: **Immediate**

Hilgraeve Inc., 800/826-2760, 313/243-0645 (fax), 313/243-5915 (BBS)

Reader service no. 830

ILLUSTRATION: JEFF BERLIN

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Hey dBASE U
And Smell T

Adding a GUI to existing dBASE applications is fast and easy with CA-dBFast.

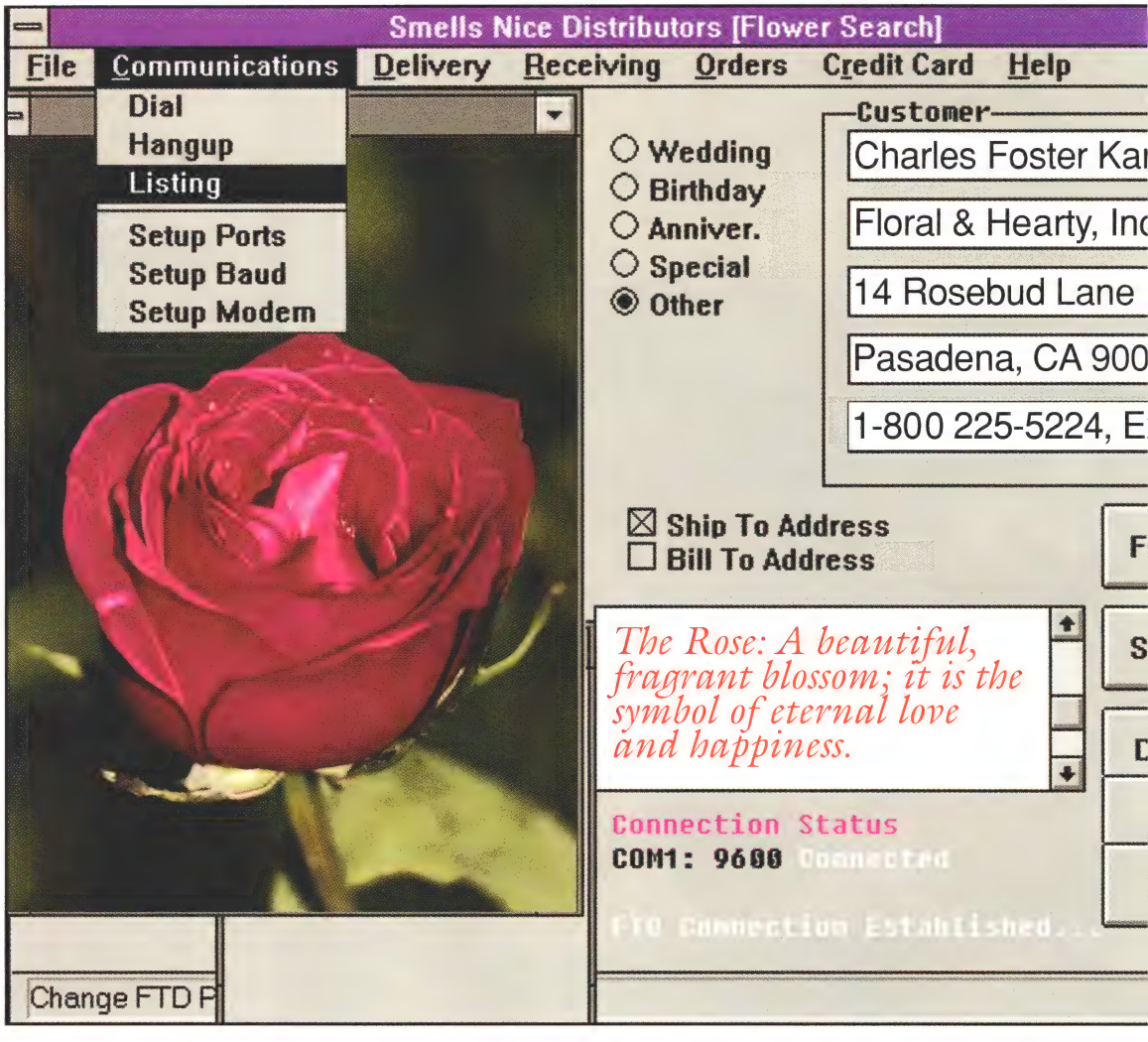
CA-dBFast's report writer, CA-RET, lets you mix text, graphics and data to produce great-looking reports in minutes.

The Visual Application Designer lets you interactively create and modify the user interface within a graphical environment.

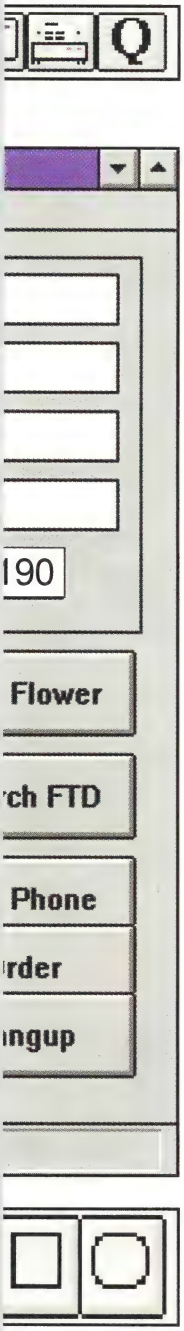
CA-dBFast is the first and only way to get graphics, including bit-maps, into Xbase applications.

CA-dBFast is a complete Xbase language development system, including an Editor, Compiler, Debugger, Application Designer and Runtime Generator.

Integration with other Windows programs is available through Dynamic Data Exchange, Dynamic Link Libraries and the Windows clipboard.



sers, Wake Up he Windows.



CA-dBFast includes Windows interface objects for pull down menus, push buttons, radio buttons, check boxes, scrolling list boxes, bit-mapped graphics and more.

The runtime compiler can produce client-server applications that support Novell Netware, LAN Manager, LANtastic and any Net-BIOS compatible LAN system.

There's only one database that can take .DBF files into Windows: CA-dBFast. Support for standard Xbase file formats also includes .NTX, .FRM and .LBL files.

The Editor can now support up to 10 open documents at once – with the look and feel of Windows word processing.

You can set and save personal preferences on Editor fonts, tab settings, colors and indentation.

A new day is dawning for millions of dBASE developers – thanks to new CA-dBFast 2.0, the first and only dBASE-compatible database and language for Windows.

NEW UPGRADE 2.0

CA-dBFast meets two giant needs: moving existing dBASE applications to Windows *and* developing dazzling new applications in record time. It's the one solution that lets you take advantage of Windows while protecting the huge investment you've made in Xbase technology.

With CA-dBFast 2.0, you get a proven, stable environment that's more visual and more intuitive than anything you've ever used. And there's no need for Microsoft's confusing, intimidating SDK, so creating applications with CA-dBFast is, true to its name, fast.

MICROSOFT® WINDOWS™ COMPATIBLE

The Visual Application Designer (VAD) makes creating pull-down menus, push buttons, radio buttons, check boxes, scrolling list boxes and other Windows objects as easy as "point and click" or "drag and drop." The VAD generates the required source code, saving you hours of complex programming. You also get a debugger that's so advanced, it lets you watch your source code execute at run time – even Single Step through execution.

DBMS COMPUTERWORLD 1-S BRAND PREFERENCE 1992 WINDOWS-BASED BEST PRICE/PERFORMANCE

1992 W 100 WINDOWS MAGAZINE ANNUAL WIN AWARD

CA-dBFast 2.0 also includes CA-RET – an outstanding Windows-based report writer that lets you mix text, graphics and data on the same report in a full WYSIWYG environment. Creating great looking tabular reports, form letters or labels is as easy as using a word processor.

FOR A FREE DEMO DISK, CALL 1-800 CALL CAI, Ext. 190.

With CA-dBFast applications, there are no license fees, royalties or key diskettes to bother with. And recipients of runtime programs don't need CA-dBFast to run the application – just Windows. CA-dBFast is also compatible with CA-CLIPPER, dBASE III Plus, dBASE IV and FoxBASE.

Free Demo Disk

So whether you want to wake up old applications or build brilliant new ones, you can't afford to sleep through this revolution.

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COMPUTER ASSOCIATES®
Software superior by design.

New CA-dBFast Release 2.0.

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Circle 65 on reader service card

PC Prices Are Great, but Choices Dwindle

WAITING GAME: Purchasing agent Mitch Siegel's order put on hold by Gateway.

Would-be PC buyers may find fewer vendors to choose from this year as the market roils in the wake of last year's vicious PC price wars. Lower profit margins and component shortages have already crippled or sunk three vendors. Buyers, sidelined by shipment delays of the most popular PC models, should find relief this spring, while price cuts will likely continue, though not at last year's rabid pace.

The lack of 486DX2 systems is the most significant current shortage. Spurred by low prices, many buyers rushed to get the systems in 1992 but encountered backlogs at a number of vendors, including IBM, Dell Computer, and Gateway 2000. Surprised by high demand, these companies were still trying to catch up in January; until they can get more of Intel's precious 486DX2 processors, however, shortages will continue.

PC vendors order components 8 to 20 weeks before they build machines, and many of them underestimated demand. Compaq, for instance, forecast that worldwide PC demand from July through September 1992 would be three to four times that of the year before. It turned out to be six times as much, said Gian Carlo Bisone, Compaq's vice president of North American marketing. The result: Consumers wait.

The delay leaves some customers stewing. Mitch Siegel, a purchasing agent at Teradyne in Boston, decided to buy 486DX2s at the end of 1992. "I called Gateway right before Christmas looking for DX2-50s, and they told me it would be four to six weeks' turn time due to component shortages," Siegel says. "I called Dell, and they said four to six weeks. The shortages aren't a joke."

How long will demand exceed supply? Gateway is having problems getting chips and SIMM memory for 486DX2s but expects to clear its backlog of orders by March, says marketing manager Mike Schmith. At IBM, 486DX2 shortages will clear up by the end of first quarter, according to spokesperson Mike Reiter. As of mid-January, orders were taking four to six weeks to fulfill. Compaq expects its shortages to end by March.

Better Deals to Come

Because demand is steady, don't expect prices for 486DX2 or other systems to drop soon, says JoeAnn Stahel, a senior market analyst at InfoCorp. "Rather than more price cuts, you'll see features added," she says.

But the price war may continue into 1993, says Bisone. The situation "is still fairly turbulent. The forecast shakeout will occur, but those companies won't just disappear, they'll go down swinging."

Meanwhile, spot component shortages are expected to continue into late spring and summer, says Dean McCarron, vice president of technology at InStat. "Right now, one of the main issues is that almost all the suppliers' inventories are depleted," he says.

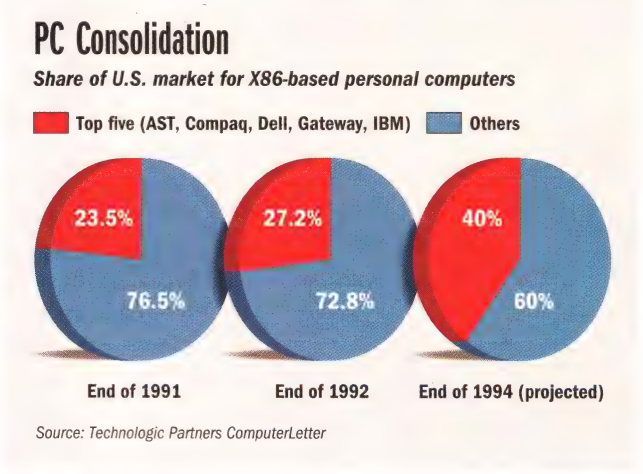
Trouble Ahead for Small Vendors

What's good for PC buyers may not be so good for smaller PC vendors, McCarron says. The price wars leave them little room for more price cuts.

"The component shortages really affect smaller companies who buy parts from distributors," McCarron says. "They end up low on the supply ladder, so they have a hard time obtaining high-demand parts. This could force some of the little guys out."

In the first week of January, Gecco Computers of Tempe, Arizona, went out of business and Fremont, California–based Everex filed for bankruptcy. In late December 1992, Cumulus of Cleveland also went under.

–Laurianne McLaughlin



THE PC PRICE WAR has cut profit margins and increased demand, leading to component shortages that may impact smaller PC makers.

PHOTO: RICK FRIEDMAN

A basic idea of how our new PC will accelerate Windows.

Now you can race through Windows™ up to ten times faster. Introducing the Epson® Progression™, the first PC with Wingine™ graphics acceleration. Developed by CHIPS™ and Technologies, this Wingine chip is less costly and complicated than typical accelerator cards, and provides more standard color capabilities than you'll find in most other personal computers.

The improvement in performance is so dramatic, you've got to see the Epson Progression to believe it. So we've created a video to let you do just that. For your free copy, call 1-800-BUY-EPSON. But hurry. They're going very, very fast.

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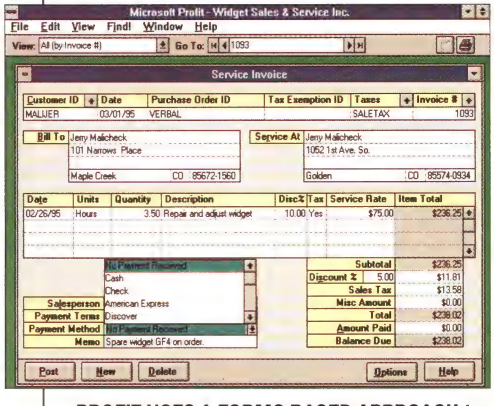
Microsoft Profit: Fill-in-the-Forms Accounting

TEST DRIVE *Microsoft Profit* makes accounting easier by eschewing accounting terminology in favor of plain English.

You can keep the books for a number of companies, limited only by your available disk capacity. When you start the books for a new company, *Profit* asks a few basic questions. These include the nature of the business, such as retail or service, and the type of ownership such as proprietorship, partnership, or corporation.

Each company's financial records are kept in its own "filing cabinet." Each filing cabinet contains six "drawers," represented by icons. Clicking on the appropriate icon lets you enter an invoice in the transactions drawer or print a financial statement in the reports drawer, for example.



PROFIT USES A FORMS-BASED APPROACH to handle your accounting transactions.

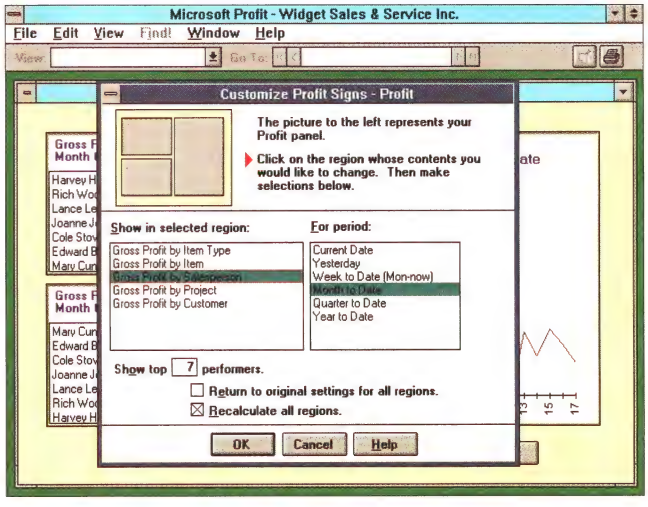
All of *Profit*'s CPA jargon is relegated to its accounting drawer, which is designed to be used periodically by your accountant for adjustment and audit purposes.

For everyday transactions you fill out a form, such as a check or an invoice, on screen. Select from a total of 25 forms that cover all common transactions. To record a sale, for example, you can pick a sales or service invoice or a quick sale form. Although you can't customize the forms, the broad selection helps you choose the one that makes the most sense for your business. *Profit*'s generous collection of forms is its strong suit and clearly differentiates it from its competitors.

After you complete a form, click on the Post button to add it to your accounting records. *Profit* maintains a history of transactions, so you can look up that old customer invoice and reprint it if necessary. This handy feature is not available in many accounting systems.

Microsoft is aiming *Profit* at businesses with less than $5 million in annual revenues and fewer than 25 employees. This well-rounded package takes care of most of the accounting functions that are required by a small business, including job costing, sales and customer receivables, payments and supplier payables, purchase orders, product inventory, and general ledger and financial statements.

Profit goes beyond the usual bookkeeping tools by showing you the big picture. The Profit Signs drawer allows you to monitor the financial vital signs of your business. You can select from 500 key numbers, ratios, and charts. *Profit* is a mini-EIS (executive information system) that can help you keep on top of operations.



YOU CAN CUSTOMIZE THE PROFIT SIGNS to monitor the financial areas that are of greatest interest to you.

Profit uses six wizards—a sequence of dialog boxes—that guide you through the steps to complete several of the more complicated accounting processes. These tasks include balancing your bank account and end-of-period processing.

Unfortunately, *Profit* handles only the no-brainer items in payroll. You can key in employee payroll payments and withholdings after you determine them manually. A full-fledged payroll program that does the dirty work of calculating gross pay and all the deductions will be available as an optional add-on to *Profit* by the end of 1993.

Profit is part of Microsoft's Solutions Series. Curiously, there is no upgrade path to convert your data easily from *Microsoft Money*, the company's personal finance program.

Although *Profit* is a Microsoft product, the development and technical support is handled by the accounting software specialists at Great Plains Software. Telephone support costs $2 per minute; bulletin board support is free.

You can use *Profit* up to five times to maintain your company's books before you must register the program. To register, call a toll-free line that's open 24 hours a day, and enter a code number.

—Richard Morochove

Microsoft Profit 1.0

WINDOWS Windows accounting package lets you keep track of small-business finances.

Key Features: Handles sales, purchases, payments, inventory, job costing and financial statements • Forms-based approach eases transition from paper-based manual accounting system • Avoids accounting jargon

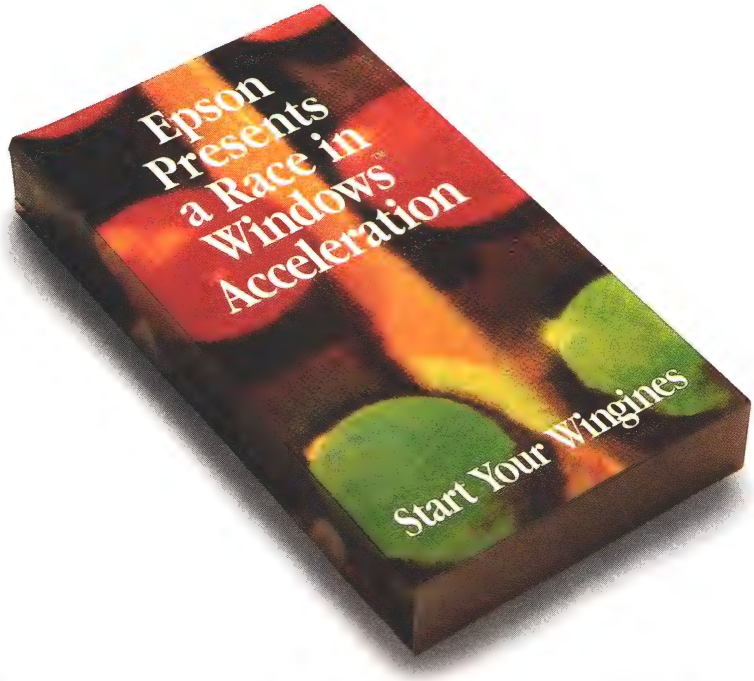
Pricing: $199

Availability: Immediate

Microsoft Corp., 800/426-9400, 206/936-7329 (fax)

Reader service no. 831

There's a lot of talk about speeding up Windows.



But only one video.

Epson's® new Progression™ PC makes Windows™ race so fast (up to ten times faster), you have to see it to believe it.

So we created a video to let you do just that.

For a free video that dramatically proves how you can race through Windows without costly and complicated accelerator cards, call **1-800-BUY EPSON.**

But hurry. They're going fast.

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Desktops *Dot Matrix* *Notebooks* *Lasers* *Servers*

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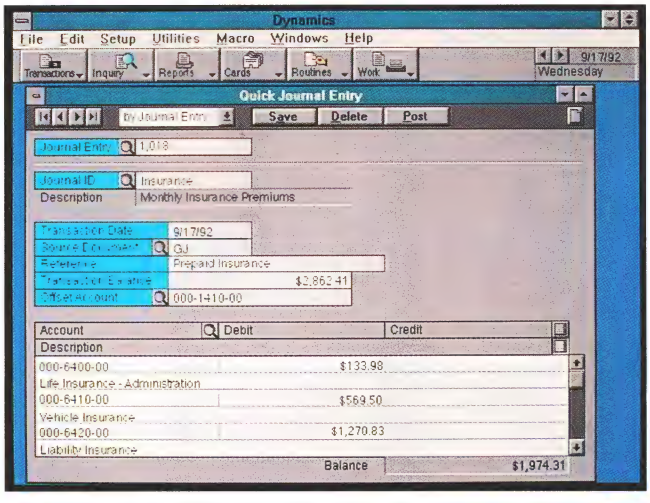
High-End Accounting Apps Ease Into Windows

It's been a long time coming, but high-end PC accounting companies are beginning to warm up to *Windows*. After years of adopting a wait-and-see approach to the widely popular graphical interface, virtually every major player in the high-end PC accounting market has announced plans to develop for the platform.

Although *Windows* accounting was embraced by entry-level developers, there's been a notable lack of activity at the higher end—makers of those products geared to meet the needs of companies with annual sales between $1 million and $100 million. That will change this year.

To date, only a couple of high-end companies are shipping *Windows* products. Platinum Software, which launched the general ledger module of *SeQueL to Platinum* in September, offers a client-server product that's based on the Microsoft/Sybase *SQL Server* at the back end and either *Windows* or OS/2 on the workstation.



CUSTOMIZED ACCOUNTING: Great Plains Dynamics for Windows lets you tailor the program to suit your business's needs.

Great Plains Software also announced *Great Plains Dynamics for Windows*, a highly customizable accounting program for *Windows*, last September. Select modules were available to resellers at the end of 1992, and Great Plains plans to sell them to the public in the first quarter of 1993.

Although most other players in the high-end market have announced products, few plan to ship them before the second half of the year. That opens possibilities for new players, says Corley Phillips, president and CEO of Manzanita Software Systems, the developer of *BusinessWorks*, a midrange package in the DOS market and winner of a 1990 *PC World* Best Buy. With the release of *BusinessWorks Accounting Systems for Windows*, Manzanita hopes to garner a greater share of the midrange market—companies with sales in the $500,000 to $5 million range.

The system manager, general ledger, and accounts payable modules were released in December, to be followed by payroll, job cost, order entry, and inventory modules over the the first three quarters of 1993. *BusinessWorks for Windows* is compatible with the DOS version and supports all the features in the DOS package. Although *BusinessWorks for Windows* uses standard *Windows* help, certain higher-level *Windows* features such as support for DDE won't appear until later releases.

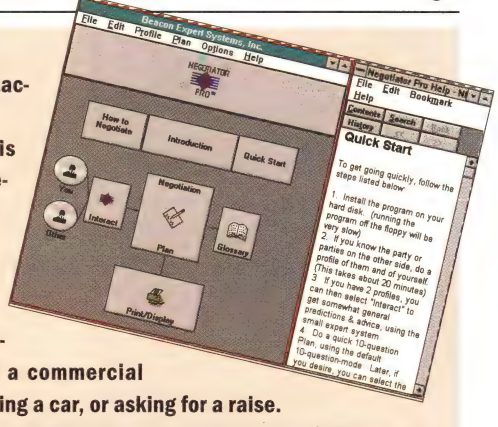
Among traditional high-end heavy hitters, Solomon Software, State of the Art, Computer Associates International, and Macola have all announced plans to enter the *Windows* accounting market. Most do not expect to begin shipping products until the second half of this year, however.

—Roberta Furger

Negotiating Help from the Pros:

Would you like to go into your next meeting or negotiation armed with a strategy designed by experts? Then check out *Negotiator Pro*, an interactive program that offers a brain trust on bargaining. The software was developed by Daniel Burnstein, chairman of the American Bar Association's Negotiation Skills Interest Group and a former associate at Harvard Law School. The program discusses negotiating tactics and ethics, using information from Burnstein's research and some 200 books and studies.

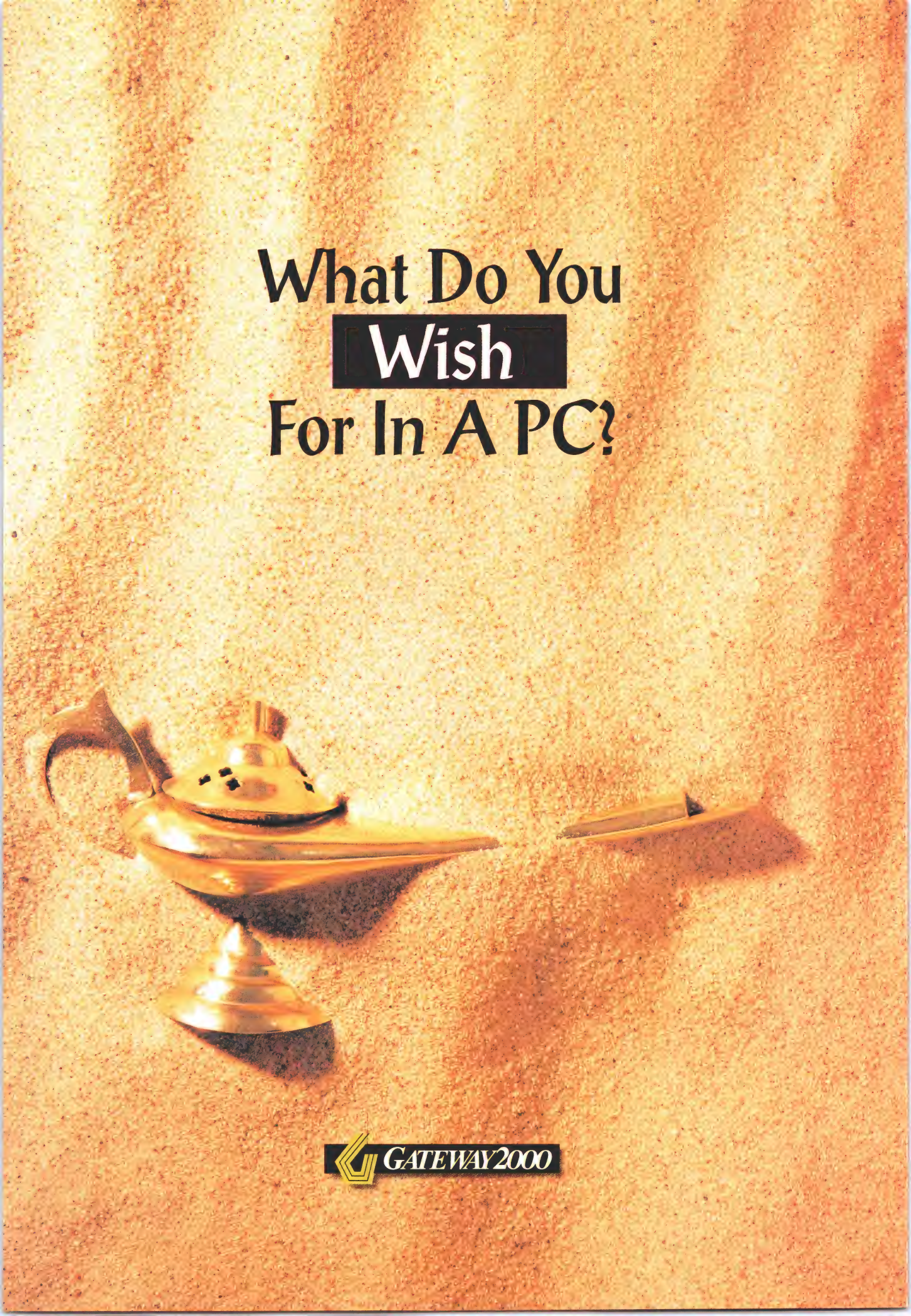
You begin by answering 11 questions about yourself and the other party; *Negotiator Pro* then constructs profiles of each side's working style and position. A subsequent Q&A session offers tactical options and helps you build the actual negotiation plan. As users answer the questions, they can tap the program's extensive hypertext capability, which provides a wealth of expert information on subjects including international negotiating styles and traditional theory on tactics and ethics.



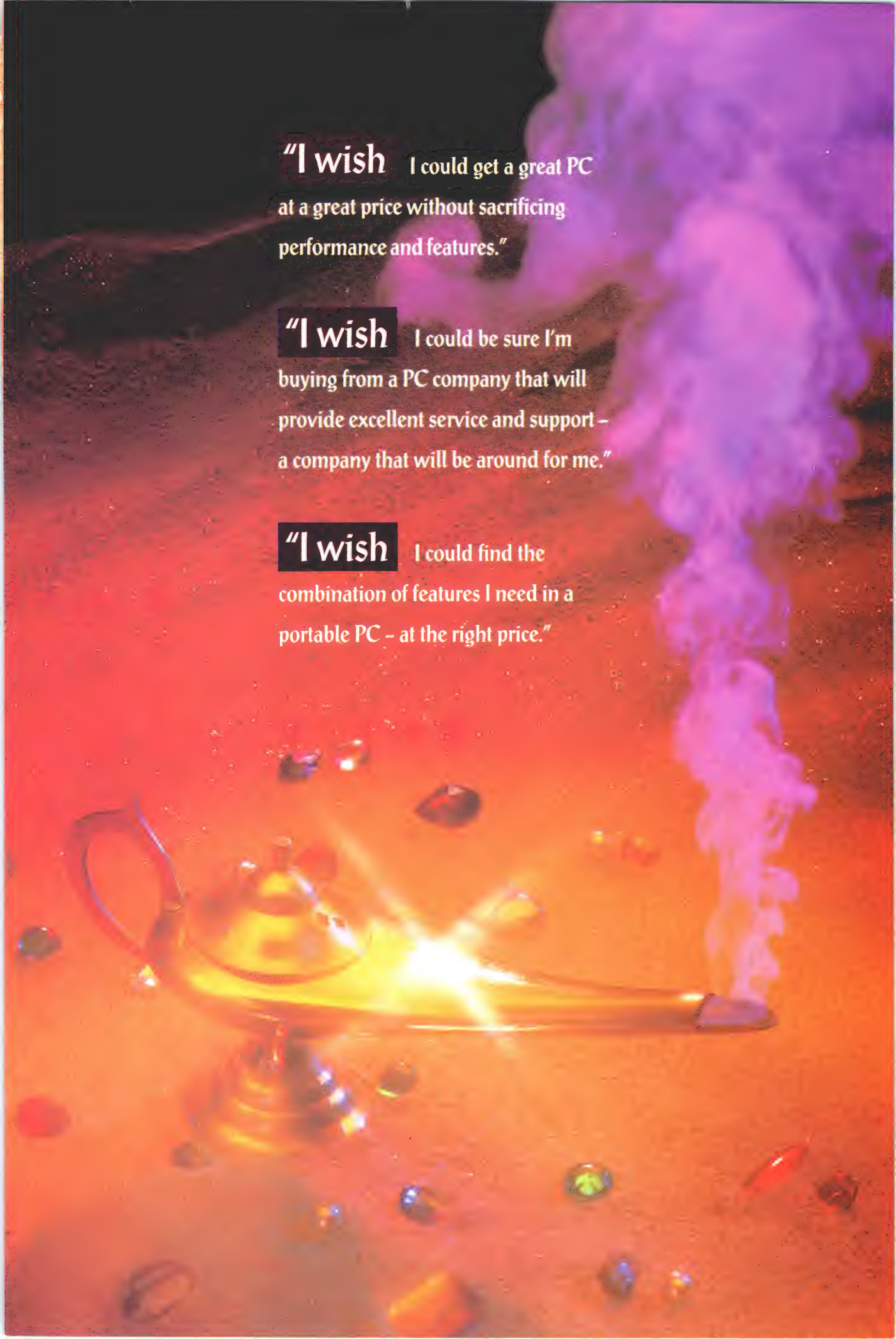
Also included is the Library of Negotiations, a mini-tutorial on how best to approach common negotiations such as settling the terms of a commercial property lease, buying a car, or asking for a raise. The software comes in DOS and Macintosh versions ($495 each) and a *Windows* version ($495). *Negotiator Pro* helps you enter your next negotiation empowered by expert rules, tools, and the knowledge of expert negotiators. Reader service no. 832

—Laurianne McLaughlin

What Do You Wish For In A PC?



Your Wish Is Our Command!


"I wish I could get a great PC at a great price without sacrificing performance and features."
"I wish I could be sure I'm buying from a PC company that will provide excellent service and support – a company that will be around for me."
"I wish I could find the combination of features I need in a portable PC – at the right price."

Your wish is our command at Gateway 2000! We can grant you the three most universal PC wishes in the wink of an eye. As a fringe benefit, we won't limit you to three wishes here. Most anything your heart desires in computers (sorry, we can't grant wishes for romance or riches), you can get from Gateway.

That's because we built our business by listening to our customers' wishes and doing everything in our power to make their dreams come true. At Gateway, we believe you should be able to *have it all*: the latest technology, glittering performance, quality construction, enchanting service and the fairest prices in the land. All this from a financially healthy company that won't run dry and leave you stranded in the desert.

You don't have to settle for less. With Gateway 2000, you can have it all. Draw up your wish list and give us a call. We'll make some truly magical values materialize for you.

GATEWAY2000

Gateway Grants You The Most Wonde

"I wish I could get a great PC at a great price without sacrificing performance and features." Your wish is our command!

You'll be spellbound by Gateway's ferociously competitive prices on systems that are unequaled in powerful performance, impressive features and graceful integration of components. Other companies make the same claims, but the truth is revealed when readers and editors of the most popular PC magazines are asked which company delivers on its promises. Their overwhelming response is Gateway 2000.

"Gateway has gone far beyond conventional ideas of price and performance. In doing so, it has created new rules that other PC makers will have to follow if they want to remain players."

– *PC Computing*, 1992 MVP Awards

"Gateway 2000 was the big 1992 Best Buy winner, sweeping not only the desktop awards as it did last year, but the newly expanded notebook categories as well ... Altogether, Gateway won five Best Buy awards this year, including Best Overall System Vendor ... It's no surprise that Gateway is consistently the people's choice when it comes to systems. Its formula for success is to sell fully configured PCs at aggressive, how-can-they-do-that prices, along with comprehensive service and technical support."

– *Computer Shopper*, 1992 Readers' Best Buy Awards

rous Value In The Land.

"Gateway not only captured the title for best desktop, it also got the nod for best service and support and ranked in the top five for portables, notebooks, most promising newcomer and best mail-order firm."

– *PC World*, 1992 Readers' Choice Awards

"I wish I could be sure I'm buying from a PC company that will provide excellent service and support – a company that will be around for me." Your wish is our command!

Twice in 1992, Gateway was honored for outstanding service. *PC World* readers ranked Gateway number one in service and support. And *PC Magazine* readers gave Gateway the best overall scores in the 1992 Service and Reliability Survey.

Just as important is our strength as a company. Warranties and assurances of lifetime technical support don't mean anything unless a company survives to honor them, which is a serious consideration in the shifting sands of today's PC marketplace.

Gateway is among the few financially robust companies in the industry. Our 1992 revenues exceeded $1 billion and our earnings are among the strongest in the industry. The company is virtually debt-free. At a time when other companies have been forced to lay off employees, we added 300 people to our staff. You now have 1,800 friends in the business. Rest assured Gateway is your oasis that will never leave you high and dry. We'll be here for you!

GATEWAY2000

800-846-2000

For The Nomad In You.

"I wish I could find the combination of features I need in a portable PC - at the right price." Your wish is our command!

No matter what you need in a portable, you'll find it in one of our Nomad notebooks.

Gateway customers selected Nomads as the winners in 386 and 486 notebook categories of *Computer Shopper's* 1992 Best Buy Awards.

"There are faster laptops, there are cheaper laptops, there are color laptops, but there is no better laptop ... Weighing in at only 5.6 pounds, the Nomad combines the powerful punch of a 25MHz i486DX with a working battery life of more than six hours. At long last, we have a laptop that can really go the distance when there's no power outlet in sight."

– *Computer Shopper*, 1992 Readers' Best Buy Awards

PC Sources echoed *Computer Shopper's* conclusions. "The Nomad 425DXL packs an awful lot of computing into a case that's just 1.7 inches high. Its excellent 79-key keyboard has a great typing feel ... The fine video system includes a large backlit black-on-white LCD ..."

New this month is the Nomad 450DXL including Intel's 50MHz 486DX2L processor for blazing performance.

Our Caravan Of Extras.

Software Selections

Your every software need is our command. With mini desktop, desktop and tower systems that include "choice of application software," select one of the following applications, all latest versions:

- Microsoft® Excel for Windows™
- Microsoft Word for Windows™
- Microsoft Word and Bookshelf 92,® CD-ROM Edition
- Microsoft PowerPoint for Windows™
- Microsoft Project for Windows™
- The MS Entrepreneur Pack (Works,™ Publisher,™ Money,™ TurboTax for Windows® from ChipSoft, and games)
- Borland Paradox® or dBASE IV®
- The Windows Programmer Pack (MS Quick C,™ Visual Basic and more)
- Upgrade to Microsoft Office™ for $175

If the system you want comes with Works for Windows,™ you can upgrade to one of the software choices above for only $150.

Utilities Included, Too

Cool Tools for DOS, a diagnostic and utilities package, comes with all Gateway desktop systems and includes: QA Plus™ from Diagsoft,™ Central Point® Anti-Virus, RAM Boost, Defrag and Emergency Disk.

Microsoft Windows™ for Workgroups

Windows for Workgroups is ideal for e-mail, group scheduling and resource sharing, and includes an Ethernet adapter and software. Hardware and software are factory-installed. You can see Windows for Workgroups running on Gateway systems in any of over 200 Egghead Software® stores in the U.S. Stop by for a demonstration! With the purchase of a system, Windows for Workgroups is specially priced at just **$159**!

Microsoft Windows Sound System™

This sound system designed especially for business use lets you speak to your PC for hands-free operation. It even reads numbers back to you for proofing. You can also embed audio messages in all your Windows OLE applications. Package includes soundboard, microphone, headset and software. You pay only **$149** with the purchase of a system.

CD-ROM Kit

Includes CD-ROM, interface card and everything you need to add MPC-compliant CD-ROM to your PC. With a system purchase, or if you own a Gateway system, you can buy this CD-ROM kit for only **$225**!

The TelePath™ Fax/Modem

A 14,400bps modem, V.32bis, with 9,600bps fax capability. Includes WinFax Pro,™ Crosstalk™ for Windows, Qmodem™ and more. **$195**

CrystalScan™ 15-Inch Monitor

Non-interlaced 15-inch color monitor with flat, square screen – an upgrade option only at the time of purchase on any Gateway 2000 desktop system for only **$100**.

Panasonic Color-Capable Printer

Add color to your documents with this Panasonic KXP2123 24-pin dot matrix printer. Includes Adobe Type Manager.® Printer, **$259**; Color Option, **$50**

Most Gateway peripherals are sold only with the purchase of a Gateway system. For details on our complete line of components, peripherals and software, call direct to our special add-on components division at ***800-846-2080.***

GATEWAY2000

800-846-2000

Gateway 2000's Magical Values

DESKTOP SYSTEMS

3SX-33

- 33MHz 386SX Intel® Processor*
- 4MB RAM
- 5.25" & 3.5" Diskette Drives
- 80MB 17ms IDE Hard Drive
- Windows Accelerated Video with 1MB DRAM
- 14" Color CrystalScan™ 1024NI
- Mini Desktop Case
- 5 16-Bit ISA Slots
- 124-Key AnyKey™ Keyboard
- MS-DOS,® Windows™ & Mouse
- Cool Tools for DOS
- MS Works for Windows™ 2.0

$1295

4SX-25

- 25MHz 486SX Intel Processor*
- 4MB RAM
- 5.25" & 3.5" Diskette Drives
- 170MB 13ms IDE Hard Drive
- Local Bus IDE Interface
- Windows Accelerated Video with 1MB DRAM
- 14" Color CrystalScan 1024NI
- Mini Desktop Case
- 5 16-Bit ISA Slots
- 124-Key AnyKey Keyboard
- MS-DOS, Windows & Mouse
- Cool Tools for DOS
- MS Works for Windows 2.0

$1495

4SX-33

- 33MHz 486SX Intel Processor*
- 4MB RAM, 64K Cache
- 5.25" & 3.5" Diskette Drives
- 170MB 13ms IDE Hard Drive
- Local Bus IDE Interface
- Windows Accelerated Video with 1MB DRAM
- 14" Color CrystalScan 1024NI
- Mini Desktop Case
- 5 16-Bit ISA Slots
- 124-Key AnyKey Keyboard
- MS-DOS, Windows & Mouse
- Cool Tools for DOS
- Choice of Application Software

$1695

4DX-33

- 33MHz 486DX Intel Processor*
- 4MB RAM, 64K Cache
- 5.25" & 3.5" Diskette Drives
- 250MB 13ms IDE Hard Drive
- Local Bus IDE Interface
- Windows Accelerated Video with 1MB DRAM
- 14" Color CrystalScan 1024NI
- Mini Desktop Case
- 5 16-Bit ISA Slots
- 124-Key AnyKey Keyboard
- MS-DOS, Windows & Mouse
- Cool Tools for DOS
- Choice of Application Software

$1995

4SX-33V

- 33MHz 486SX Intel Processor*
- 8MB RAM, 64K Cache
- 5.25" & 3.5" Diskette Drives
- 170MB 13ms IDE Hard Drive
- Local Bus IDE Interface
- VESA Local Bus ATI Ultra Pro with 1MB VRAM
- 15" Color CrystalScan 1572FS
- Desktop Case (Tower Upgrade)
- 8 16-Bit ISA Slots, 2 with 32-Bit VESA Local Bus
- 124-Key AnyKey Keyboard
- MS-DOS, Windows & Mouse
- Cool Tools for DOS
- Choice of Application Software

$2195

4DX-33V

- 33MHz 486DX Intel Processor*
- 8MB RAM, 64K Cache
- 5.25" & 3.5" Diskette Drives
- 250MB 13ms IDE Hard Drive
- Local Bus IDE Interface
- VESA Local Bus ATI Ultra Pro with 1MB VRAM
- 15" Color CrystalScan 1572FS
- Desktop Case (Tower Upgrade)
- 8 16-Bit ISA Slots, 2 with 32-Bit VESA Local Bus
- 124-Key AnyKey Keyboard
- MS-DOS, Windows & Mouse
- Cool Tools for DOS
- Choice of Application Software

$2495

4DX2-66V

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- 8MB RAM, 256K Cache
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- VESA Local Bus ATI Ultra Pro with 1MB VRAM
- 15" Color CrystalScan 1572FS
- Desktop Case (Tower Upgrade)
- 8 16-Bit ISA Slots, 2 with 32-Bit VESA Local Bus
- 124-Key AnyKey Keyboard
- MS-DOS, Windows & Mouse
- Cool Tools for DOS
- Choice of Application Software

$2995

4DX2-66E

- 66MHz 486DX2 Intel Processor*
- 8MB RAM, 256K Cache
- 5.25" & 3.5" Diskette Drives
- 500MB 11ms SCSI Hard Drive
- 32-Bit EISA SCSI Controller
- Windows Accelerated Video with 1MB DRAM
- 14" Color CrystalScan 1024NI
- Tower Case
- 8 32-Bit EISA Slots
- 124-Key AnyKey Keyboard
- MS-DOS, Windows & Mouse
- Cool Tools for DOS
- Choice of Application Software

$3795

486 Notebooks

NOMAD 425SXL

- 25MHz 486SX Intel Processor*
- 4MB RAM
- 3.5" Diskette Drive
- 80MB IDE Hard Drive
- Backlit 10" VGA Screen, 64 Grays
- Simultaneous Video with 256K
- Size 8.5" x 11" x 1.8", 5.6 Lbs.
- 6-Hr. NiCad Battery & AC Pack
- 1 Parallel/1 Serial Port
- 79-Key Keyboard & FieldMouse™
- MS-DOS 5.0 and Windows 3.1
- MS Works for Windows 2.0

$1995

NOMAD 425DXL

- 25MHz 486DX Intel Processor*
- 4MB RAM
- 3.5" Diskette Drive
- 120MB IDE Hard Drive
- Backlit 10" VGA Screen, 64 Grays
- Simultaneous Video with 1MB
- Size 8.5" x 11" x 1.8", 5.6 Lbs.
- 6-Hr. NiCad Battery & AC Pack
- 1 Parallel/1 Serial Port
- 79-Key Keyboard & FieldMouse
- MS-DOS 5.0 and Windows 3.1
- MS Works for Windows 2.0

$2595

NOMAD 450DXL

- 50MHz 486DX2 Intel Processor*
- 8MB RAM
- 3.5" Diskette Drive
- 200MB IDE Hard Drive
- Backlit 10" VGA Screen, 64 Grays
- Simultaneous Video with 1MB
- Size 8.5" x 11" x 1.8", 5.6 Lbs.
- 6-Hr. NiCad Battery & AC Pack
- 1 Parallel/1 Serial Port
- 79-Key Keyboard & FieldMouse
- MS-DOS 5.0 and Windows 3.1
- MS Works for Windows 2.0

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*Contains an Intel386™ or Intel486™ microprocessor

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Wyse Network-Ready PCs Make LAN Building Plug-and-Play

PLUG-AND-PLAY LAN: Wyse's Decision PCs are network ready, with preconfigured hardware and Microsoft's Windows for Workgroups.

The concept of plug-and-play has come a long way. Last year vendors began selling systems with preconfigured software. More recently, NEC introduced the Ready systems, with both a modem and preconfigured communications software. Now Wyse Technology extends this concept with its network-ready Decision line, which comes preconfigured with networking hardware and Microsoft's *Windows for Workgroups*.

Simplicity is the key. Connect two or more Decision systems with the included cabling, flip them on, and you have a peer-to-peer network. This type of network lets small offices and work groups share files, E-mail, peripherals, and scheduling without a dedicated server.

Setting up two network-ready Decision PCs and connecting the networking cable took us less than 15 minutes. If you're already on a network, take note: *Windows for Workgroups* is compatible with Novell NetWare and *Microsoft LAN Manager*. This means managers in large offices can create a small network with anyone using *Windows for Workgroups* and still be connected to the main NetWare network. *Windows for Workgroups* simply treats the NetWare server as another drive on the system.

The Decision PCs integrate ethernet networking electronics into the system, so you don't have to install add-in cards. Wyse also includes an ethernet cable, which is available in different lengths and types: thin or thick coaxial, or twisted pair.

These systems include all the amenities and come in three variations. The Decision 486si models boast 486 processors ranging from a 33-MHz 486DX up to a 66-MHz 486DX2. Each comes with 256K cache, a 200MB hard drive, 4MB of RAM, and Wyse's Hyper16 Video, a proprietary local bus.

The systems have six expansion slots and five drive bays. They include ZIF sockets for easy upgrades all the way to a 66-MHz OverDrive and hold 64MB of RAM.

Prices start at $2349 for the 33-MHz 486DX, $2619 for the 50-MHz 486DX2, and $2879 for the 66-MHz 486DX2.

—Randy Ross

Wyse Decision Systems

These systems feature preinstalled ethernet hardware and Windows for Workgroups.

Wyse Technology
800/438-4993,
408/473-1200
List price: from $2619
Reader service no. 690

How to Get HP IIs and IIIs to Print Like 4s

Hewlett-Packard's new 600-dpi LaserJet 4 promises to make higher-resolution output and superfast printing de rigueur. But this doesn't mean that you have to throw out your veteran 300-dpi HP Series II or Series III laser printer. The Laser Printer Accessories printer enhancement board can extend the useful life of those older printers. It is also PostScript compatible, although you won't find much of a performance improvement when you're printing PostScript documents.

The $599 doubleRES IV gooses the printing mechanisms inside HP Series II and III printers with a patented process that allows them to generate 600-by-600-dpi output. This higher resolution means better-looking text and graphics.

The doubleRES IV also accelerates *Windows* printing by compressing files before they reach the printer. These smaller documents reach the printer sooner than larger, uncompressed versions. At the printer, the doubleRES IV board decompresses the files. In informal tests, an HP LaserJet II with the board installed printed complex word processing and graphics documents up to three times faster than the same printer without the board.

Installation is relatively painless. You plug the board into the HP's I/O slot located next to the other ports on the back of the printer. Then set the I/O port menu on the front panel to Optional and install the printer driver. Finally, you connect the parallel printer cable running from your PC, switch box, or network print server to the doubleRES IV board.

—Randy Ross

doubleRES IV

This product boosts LaserJet Series II and III Windows printing speed and output quality.

Laser Printer Accessories Corp.
800/225-4098,
619/485-8411
List price: $599
Reader service no.691

VideoSpigot: Low-End Leader in Desktop Video-Capture Boards

VIDEO FOR THE REST OF US: The SuperMac Technology $499 VideoSpigot is a PC add-in card that captures video.

Desktop video promises to do for video production what desktop publishing did for publishing—put a technology once hoarded by a few into the hands of many. The first enabling products are here and relatively easy to use. The prime example is Microsoft's *Video for Windows*, a program that lets you store, play back, edit, and incorporate full-motion digital video into other applications.

But software can't do it alone, and that's where SuperMac Technology's $499 VideoSpigot comes in. This add-in board captures video from common sources such as VCRs, video cameras, and television so you can store the data on a hard drive or on removable media. Using *Video for Windows*, you can display the results on any graphics accelerator–equipped 386DX-25, whether or not it has the VideoSpigot. SuperMac plans to bundle *Video for Windows* and an assortment of presentation and multimedia products from Asymetrix, including *Multimedia Make Your Point*.

To run the VideoSpigot, you will want a 486 with from 8MB to 16MB of RAM, a high-performance video card with at least 256-color capability, and 60MB to 100MB of free space on a fast hard disk. If you want synchronized audio, you'll need a compatible soundboard such as Creative Labs' Sound Blaster. For input, the VideoSpigot includes an RCA jack for video signals produced by most consumer VCR and video products, as well as an S-VHS jack for higher-end video devices. The board is compatible with PAL, SECAM, and NTSC video formats.

When choosing a desktop video board, you need to consider the size of the images you want to capture and display, the rate at which you will capture them, and the amount of disk space the captured video will require. Larger images are easier to see but need more PC horsepower—the system must transfer and store all that data (1 minute of 320-by-240-pixel images in 256 colors can take 17MB of space). The capture rate, measured in frames per second, determines whether your work plays back in smooth real-time video motion or spastic, jerky motion. As a rule, 30 frames per second is considered real-time, 24 frames per second (the speed of motion pictures) is adequate, and 15 frames per second is slow but tolerable.

On a 486-33, the VideoSpigot can capture 30 frames per second in a 160-by-120-pixel, 2-inch window, or half that many in a 320-by-240-pixel window. On a 386DX-33, we captured 15 frames per second in the smaller window.

SuperMac includes compression/decompression software that can compress audio and video to 1/25 their original size (that would let you pack a 2-hour video with sound onto a CD ROM). As CD ROM mastering devices become affordable, PC users will be able to shoot, edit, and distribute videos that can play on a properly equipped computer. Hollywood had better watch out.

—Randy Ross

SuperMac VideoSpigot

A potential price/performance leader for desktop video-capture products.

SuperMac Technology Inc.
408/245-2202
List price: $499
Reader service no. 692

Dell's Entry-Level System

Dell's 333s/L system joins the new cast of under-$1000 PCs from companies such as ALR (see "News Monitor" in February's *Top of the News*).

This 33-MHz 386SX system, suitable as a network workstation or for use by novices, lists for $810 in a basic configuration with 2MB of RAM, a 50MB hard drive, and one 3½- or 5¼-inch floppy drive. Adding a VGA monitor ($249) plus a mouse and preinstalled DOS and *Windows* ($150) brings the total to $1209.

Users may find that entry-level configuration a tad underpowered for *Windows*. You can step up to a 120MB hard drive, 4MB of RAM, a VGA monitor, and preinstalled DOS and *Windows* for $1449.

Measuring 4 by 15 by 15.6 inches, the system is more compact than previous Dells and leaves you more room on your desk. However, the smaller size limits expandability. You'll find only three expansion slots, and the power supply is just 100 watts. Moreover, this machine has no processor upgrade path, although it does have a socket for a 387SX math coprocessor.

The Dell is priced similarly to IBM's entry-level PS/ValuePoint, but it's less expandable and has a smaller hard drive: IBM's $899 25-MHz 386SLC PS/ValuePoint 325 T without a monitor has five slots, an 80MB hard drive, and a 145-watt power supply. Memory is expandable to 16MB and hard drive options go up to 500MB.

—Laurianne McLaughlin

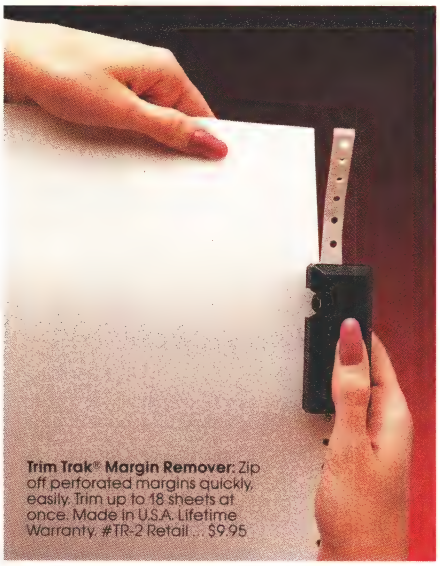
Dell 333s/L system

Dell's new entry-level system replaces its 325SX with a faster, 33-MHz 386SX

Dell Computer Corp.
800/289-3355,
512/338-4400
List price: from $810 without monitor
Reader service no. 693

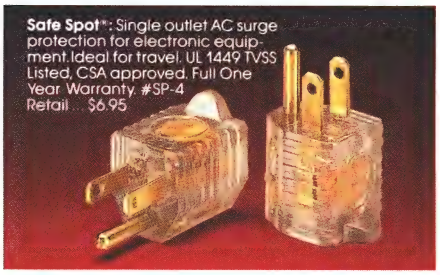
The Experts in Accessories

Manufacturing Company, Inc.
CURTIS

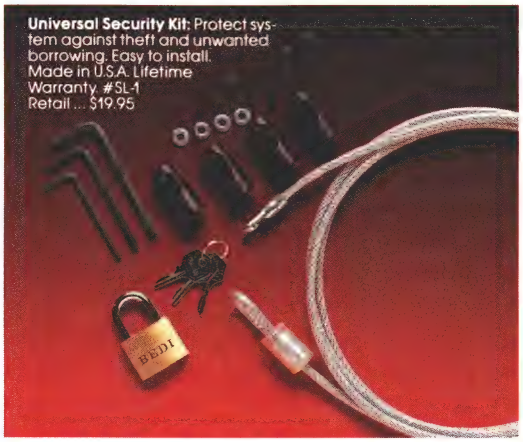


Trim Trak® Margin Remover: Zip off perforated margins quickly, easily. Trim up to 18 sheets at once. Made in U.S.A. Lifetime Warranty. #TR-2 Retail ... $9.95

Computer Cleaning Kits: Clean Screen anti-static wipes. #CK-3 Retail ... $9.95. Clean Mouse with 2 scrubbing balls fits any mouse. #MC-1 Retail ... $14.95. Clean Drive for 3½" or 5¼" disk drives. #CK-4 (5¼") Retail ... $9.95. #CK-5 (3½") Retail ... $9.95



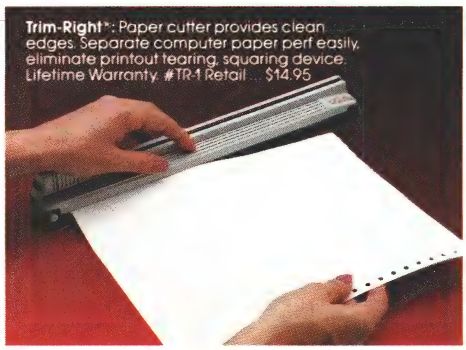
Safe Spot®: Single outlet AC surge protection for electronic equipment. Ideal for travel. UL 1449 TVSS Listed, CSA approved. Full One Year Warranty. #SP-4 Retail ... $6.95



Universal Security Kit: Protect system against theft and unwanted borrowing. Easy to install. Made in U.S.A. Lifetime Warranty. #SL-1 Retail ... $19.95

Safe-Fax®: Single outlet AC and phone line surge protection for FAX/telephone/modem/etc. UL 1449 TVSS Listed, CSA approved. Full One Year Warranty. #SF-1 Retail ... $29.95

Keyboard Calculator: Calculate without interrupting your computer program. Solar power, 8 character LCD. Full One Year Warranty. #KC-1 Retail ... $9.95



Trim-Right®: Paper cutter provides clean edges. Separate computer paper perf easily, eliminate printout tearing, squaring device. Lifetime Warranty. #TR-1 Retail ... $14.95

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Save Time, Energy, and Money

Your work day is difficult enough. You shouldn't have to cope with uncooperative perf paper. Or surges in electrical power lines. Or skips, glitches and errors caused by dirt and grime.

These low-cost worksavers from Curtis speed you through your day, helping you avoid costly equipment repairs, data losses, and delays. So you can spend less time coping with life and more time enjoying it.

Curtis products are available worldwide.
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Manufacturing Company, Inc.
CURTIS

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30 Fitzgerald Drive, Jaffrey, NH 03452-1931

A PostScript Printer for the Common Folk

PostScript printers are quickly going the way of the PC—wait a week, get a lower price.

This time, however, the label may come as a surprise to you: Digital Equipment Corporation, noted for well-engineered, high-priced hardware, is heading down the low-price road. At the special introductory offer of $999, the DECLaser 1152 desktop laser printer costs about half as much as the company's previous laser, and for now at least, it holds the high honor of being the lowest-priced PostScript printer in town.

Built around a Canon engine, the 4-page-per-minute 1152 is a true personal laser. It supplies serial, parallel, and AppleTalk ports and, true to Digital's long-standing networking tradition, allows users to hook up to any two at once. With the printer's automatic port-switching, you can run it off both a PC and a Macintosh without getting up from your chair.

The 1152 supports PostScript Level 2 and Hewlett-Packard's PCL4. The 17 resident PostScript fonts are fewer than most PostScript printers include, but creative types can access 43 additional fonts via an optional $299 cartridge.

The printer's 6000-page-per-month duty cycle is likely to stand up to a heavy workload longer than you do. Like most lasers, it prints on letter-, legal-, and A4-size paper and on envelopes and transparencies. If you want to spruce up your presentation, Digital Equipment's optional image-enhancement firmware, *DECImage*, makes the 1152's normal 300-by-300-dpi printing look like 1000-by-1000-dpi output.

The unit's controller, built around a run-of-the-mill 16-MHz Motorola 68000 processor, was designed with Adobe's help. A standard 2MB of RAM handles most files, but if you plan to do a lot of imaging, you can boost memory to 4MB for another $150.

The printer's most complicated aspect may be its pricing schedule. You can get a single 1152 for $999, but only if you use a rebate coupon (available through ads and direct mail) and buy by March 31. Or you can buy the printer direct from DEC for $1169 and get a year's free on-site service if you also buy a Digital PC through the firm's mail-order channel, PC-By-DEC. After March the price rises to $1299 in single quantities. In volume orders of five to ten units, you'll pay $1260 each.

Those prices still looks good to us at press time. But by March, who knows?

—John Mayer

DECLaser 1152

An inexpensive PostScript laser with numerous enhancements available.

Digital Equipment Corp.
800/332-4636,
508/496-8988 (fax)
List price: $1299
Reader service no. 694

AudioMan Adds Sound, Impact to Documents

LOGITECH'S AUDIOMAN attaches to your PC's parallel port and packs a microphone, a soundboard, and a 2-inch speaker.

The battery-powered AudioMan from Logitech packs a 2-inch speaker, a microphone, and a soundboard into a 6-inch-tall external device. Thanks to a pass-through connection for the parallel port, you can use your printer at the same time.

AudioMan's software driver taps into *Windows 3.1*'s Media Control Interface so you can create, copy, and paste sound files from within OLE-compliant *Windows* software, including programs such as *Word for Windows 2.0*, *Ami Pro 2.0*, *LotusWrite*, *Quattro Pro for Windows*, *1-2-3 for Windows*, and *Excel 4.0*.

Using the $179 AudioMan is simple. To attach a voice message to a document, bring your cursor to where you want the sound, then pull down the Edit menu and choose Insert Object. The *Windows 3.1* sound recorder box appears on screen. Click on the Record button and speak into the AudioMan. Just click to stop, then click on Update to attach the message, which appears as a microphone icon. You can adjust playback volume via software or do it manually using the hardware.

Recipients just click on the icon to hear the audio file. They don't need an AudioMan—the file will play back on their PC speaker. Sound quality is about half what you'd expect to hear from an audio CD player. You can adjust quality during recording to save file space.

AudioMan can also record from CD players—you can connect a CD player or an external microphone directly through a built-in jack. An output jack lets you attach headphones or external speakers too.

Logitech officials claim that AudioMan will run for about 50 hours on two AA batteries. Battery-monitoring software comes with the product, and an AC adapter is optional.

—Laurianne McLaughlin

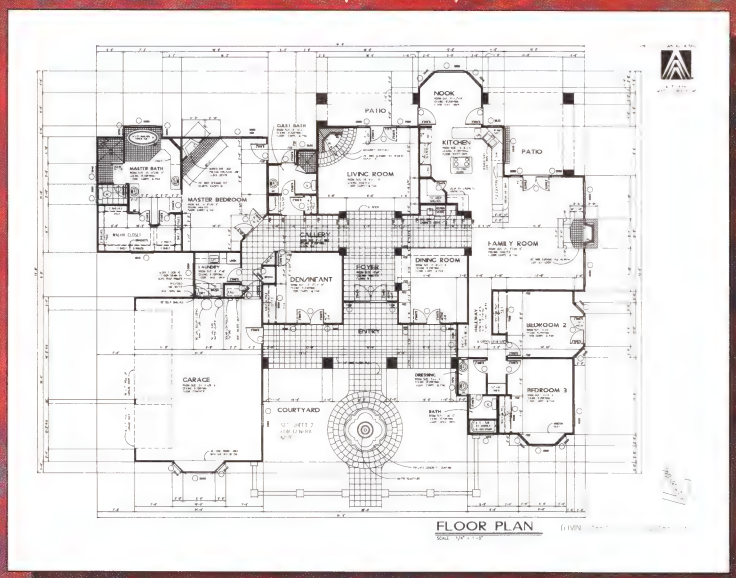
AudioMan

An economical way to save on typing and enliven your documents with sound.

Logitech Inc.
800/231-7717,
510/795-8500
List price: $179
Reader service no. 695

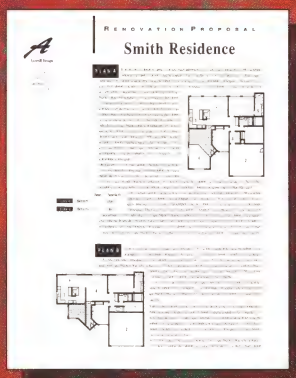
ProTracer. Where the qualities of a laser printer meet the output of a large format plotter.

C-size (17" x 22")



B-size (11" x 17")

A-size (8.5"x 11")



Laser printers offer so much. Like high quality output, speed, desktop convenience and, of course, a low price. Large format plotters, on the other hand, give you the output size you need for certain drawings and applications. What we've done is pulled all of these features together to create ProTracer™— a personal printer and plotter that produces A, B, and C-size output at an impressive 360 dpi resolution.

FEATURES INCLUDE:

- High performance Canon® inkjet engine
- Fast, Intel i960™ processor — drawings that take over one half hour on pen plotters take as little as five minutes on ProTracer!
- Optional accessories including a new, faster HP-GL® language emulation card, PostScript® language emulation, memory expansion boards, and sheet feeders
- Full vellum capabilities
- Unsurpassed customer service — 60-day money back guarantee, one year warranty, and unlimited technical support

ProTracer base unit	ProTracer with HP-GL	ProTracer with PostScript emulation
Customized ADI and PADI drivers for AutoCAD users Epson and ProPrinter emulations	ProTracer base unit HP-GL emulation card plus memory	ProTracer base unit PostScript language emulation card 8 MB memory
$1499	**$2249**	**$2897**

For the bigger picture, call Pacific Data Products at (619) 625-3562, Fax (619) 552-0889.

PACIFIC DATA PRODUCTS

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PhoenixPage

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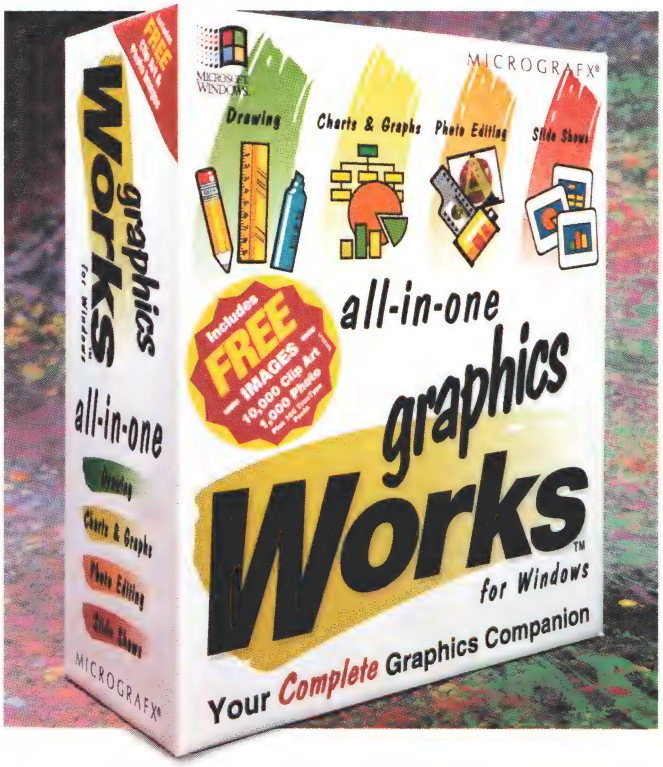
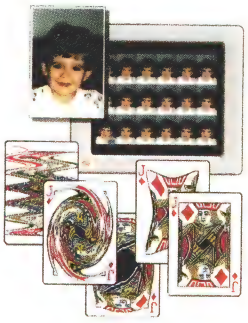
The first easy, affordable way to do it all yourself.

Produce dazzling drawings and desktop publishing!

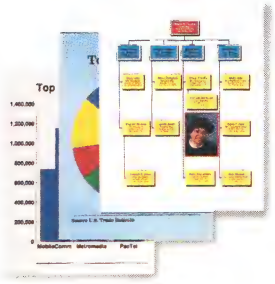
Easily do your own illustrations or use any of over 11,000 images included free to jazz up everything you produce!





Have a field day with photo images!

Choose from photo images included with Graphics Works, or scan in your own. Then retouch them right on your PC!



Create gorgeous graphs and charts!

Quickly create bar graphs, organization charts, pie charts and more, complete with photo images, clip art and 3-D effects!

Over 11,000 editable images included free!

Over 11,000 photo and clip art images are included. Customize them for desktop publishing, presentations, etc!

For less than you'd pay for a one-function graphics package, now you can get the Works!

New Graphics Works for Windows is the first graphics software that makes *all* your graphics projects fast, fun and easy. From presentations to invitations, publications to posters, layouts to logos.

You can produce your own artwork with easy-to-use drawing tools. Or choose from over 10,000 professionally-drawn clip art images included free.

You'll have a field day with photo images. Retouching them right on your PC screen, then adding them to everything you produce. Choose from over 1,000 photo images included, or scan in your own.

You'll also be able to create dazzling charts and graphs. Complete with clip art, photos, special effects and more.

And best of all, everything's integrated to work the same, easy way. You'll enjoy 24-hour telephone support too. It's just what you'd expect from the leader in Windows graphics.

So experience graphics the way they were meant to be. Exciting. Easy. And affordable. *Get Graphics Works for Windows today!*

1-800-758-1612

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Circle 183 on reader service card

Outside In 2.0 Takes You Inside Your Files

VIEW MORE FILES. The new version of Outside In for Windows can display graphics files that are inside ZIP files.

You shouldn't have to load an application and load a file into the application just to look at that file. Or print it. Or copy a piece of it to the Clipboard. With Systems Compatibility's file viewing utility *Outside In for Windows 2.0*, you don't have to.

According to Systems Compatibility, *Outside In 2.0* comes with viewers for more than 120 different file formats, including major word processing, spreadsheet, and database formats. For the first time, you can view BMP, PCX, TIFF, EPS, and other graphics files. And *Outside In* doesn't just show you the files—you can scale them to fit the current window, show them actual size in the window, magnify them, or show them full screen. You can even rotate them in 90-degree increments.

The View From Outside

Thanks to technology licensed from PKWare, you can view *PKZIP 1.x* files too. When you view a ZIP file, *Outside In* lists the compressed files within it. Double-click on one of them, and a window opens with an uncompressed view of the compressed file. You can even unzip your files to disk.

From inside *Outside In*, you can find the file you want to look at by scrolling through directories or by using the much-improved file-searching feature. *Outside In* lets you set up a number of search parameters, including file name (with wild cards); directory (with or without subdirectories); text inside; and file type, date, and size. The searches are fast and happen in the background.

Best of all, you can save search criteria in named sets. For instance, if you know you'll regularly be pulling up all the *Ami Pro* files in your \DATA directory, you can define the criteria once, save your definition as DATA_AMI, and from then on do the search with three clicks of your mouse.

Once you've found the file you're looking for, you can print all or part of it, search for text, copy all or part to the Clipboard, or in one step launch its application and load the file.

While not claiming to be a full-fledged file manager, *Outside In* does let you copy, move, and delete files.

Learning *Outside In* is easy, but you don't have to learn it to use it. When you install the program, it places hooks into *Windows'* File Manager—with your permission—which effectively give File Manager *Outside In*'s file-viewing capabilities. It does the same thing with *Norton Desktop for Windows*, where it replaces *Norton*'s less versatile file viewers with its own.

The program can also add its file-viewing tools to the *Windows* versions of *cc:Mail, Microsoft Mail, WordPerfect Mail,* and *Da Vinci E-mail.* If someone sends you a message with a file attached, you can view, search, print, or copy that file without first moving it to your hard disk.

Outside In 1.x was a great program. The new additions make it—after a few days' use—an absolute necessity.

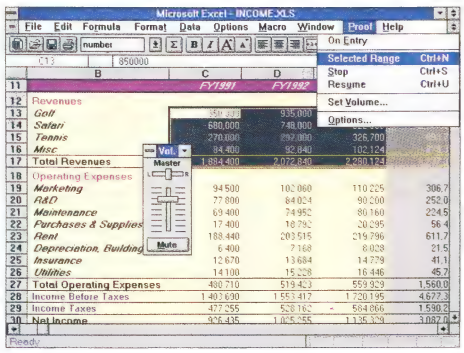
—Lincoln Spector

Outside In 2.0

WINDOWS Support for graphics and ZIP files and hooks into popular E-mail packages make the new Outside In file-viewing utility a must-have.

Systems Compatibility Corp.
800/333-1395,
312/329-0700,
312/670-0820 (fax)
List price: $89
Reader service no. 696

What business does sound have in a computer?



For starters, you can increase your productivity when you proof spreadsheets with the new Microsoft® Windows™ Sound System. Just highlight a series of numbers or words on the screen and it will read them back to you. It will even read them aloud as you enter them, if you like. To hear more, turn the page.

486s for people who demand more for their money. And get it.

Now you can get all the power and speed you need. From a computer that's so easy to upgrade and expand you may never outgrow it. Every one of our 486 PCs gives you advantages like powerful processing, expandability and upgradability using Intel® OverDrive™ processors. Every one comes bundled with Microsoft® software such as MS DOS®, Windows™ and more. And because these 486s are from Leading Edge, every one also includes free telephone support and on-site warranty service. With 486s like these, you're sure to find one that meets all of your demands. Right down to an affordable price. To learn more, or for the name of a store near you, call us at 1-800-874-3340.

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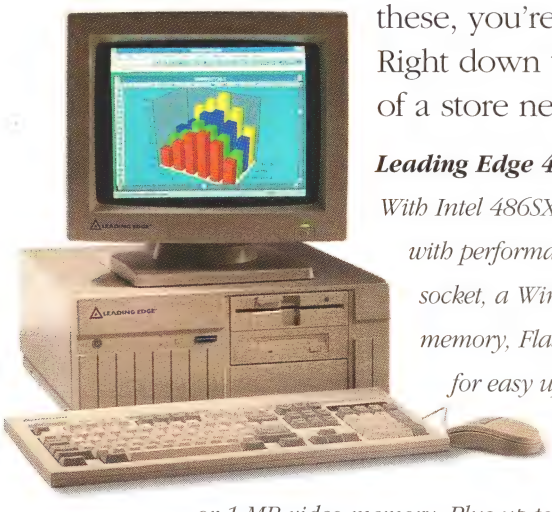

Leading Edge 486 Systems. *Available in both desktop and minitower platforms. With Intel 486SX/25 to 486DX2/66 microprocessors. Advanced configurations available with performance enhancing features such as a local bus socket, a Windows accelerator board, up to 256 KB cache memory, Flash EPROM or a ZIF microprocessor socket for easy upgrading. All 486 systems have 4 MB RAM (expandable to 32 MB) and 1024 x 768 graphics resolution with 512 KB or 1 MB video memory. Plus up to 7 available expansion slots, dual floppy drives, high performance hard drives and large power supplies.*

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Nobody puts more into computers.™

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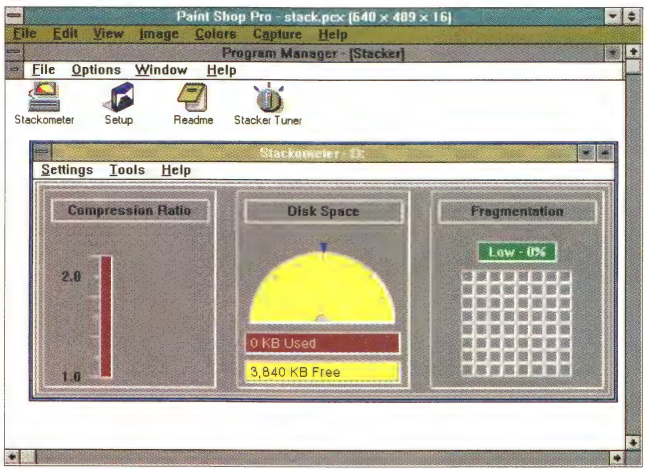
Circle 11 on reader service card

New Generation of Data Compression Programs

For the longest time, data compression programs were a lot like gut feelings: Either you trusted them or you didn't. Although they typically let you double the capacity of your hard drive at minimal cost, they had drawbacks. Because these programs worked by converting data into a proprietary shorthand, popular disk utility tools such as *Norton Utilities*, *PC Tools*, and *SpinRite* could be confounded by—and sometimes even hazardous to—compressed data. If you wanted to optimize a disk or recover lost data, you were often out of luck.



STACKER 3.0 includes several useful features for Windows users. The Stackometer shows the status of the current drive.

New Disk Utilities

Thanks to their new bundled disk utilities, the latest versions of Stac Electronics' *Stacker* and AddStor's *SuperStor* merit consideration by anyone who's running short on cash and storage space. The new versions—the $149.95 *SuperStor Pro* and the $149 *Stacker 3.0 for Windows and DOS*—include enhanced disk optimization tools, password protection, and painless deinstall features that return a drive to its original uncompressed state. Like their predecessors, both products are fast and virtually transparent to the user, compressing data automatically as it is stored and decompressing it when it is retrieved. And both work with a larger variety of storage devices, including Bernoulli boxes and magneto-optical drives.

Stacking Up Improvements

Stacker 3.0 boasts several improvements over its earlier iterations. A *Windows* Express Setup program makes preparing a system for compression a snap. (Instead of compressing the entire hard disk, users can easily set aside a portion of the disk as a compressed drive.) Other *Stacker* improvements include a function that lets systems without the program both read and write to a compressed floppy disk, and the capability to calibrate the degree of compression and hard disk performance. The vendor claims EMS support reduces *Stacker*'s conventional RAM usage to 26K. This new software version works with *Stacker*'s existing compression boards.

Windows Compatible

SuperStor Pro is Addstor's upgrade to *SuperStor 2.0*. Improvements include *Windows* compatibility and a tune-up analyzer that examines disks to determine if the product's defragmentation or recompression will improve performance or compression. A specialized JPEG image-compression utility licensed from Optibase lets you compress high-resolution graphics files to as much as 1/20 their original size. EMS, the vendor claims, lets you reduce conventional memory use to as little as 10K.

—Randy Ross

Stacker 3.0

WINDOWS **Enhanced Windows-compatible version of this popular product is fast and easy to use.**

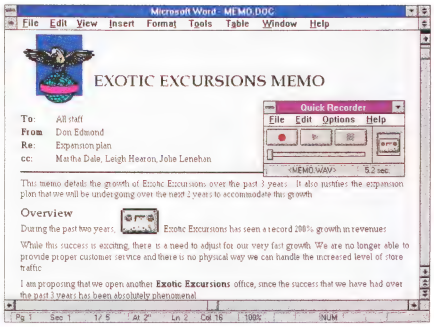
Stac Electronics
800/522-7822,
619/431-7474
List price: $149
Reader service no. 697

SuperStor Pro

WINDOWS **This upgrade includes Windows compatibility for ease of use and JPEG image compression for high-resolution images.**

AddStor Inc.
800/732-3133,
415/688-0494
List price: $149.95
Reader service no. 698

What business does sound have in a computer?



Now you can communicate more effectively by adding your voice, or even music, to documents and presentations. Just record it, drag it and drop it in.

Microsoft Windows Sound System can also recognize and execute spoken commands like *open*, *cut* and *paste*. You can easily create custom commands in any application for the Microsoft Windows™ operating system. Want to hear something else? Turn the page.

What's *missing* from your system?

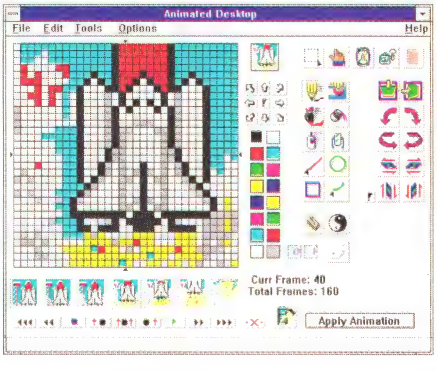
How about some *fun*!

Introducing Animated Desktop *for Windows*™

Point and click, point and click. Boring, boring! Bring your desktop to life! Make your icons and cursors come alive with colorful animation and booming sound effects. You and your friends will be delighted when you see and hear the animations you create.

Check out these great features:

- ▶ Icon & Cursor Editor: Make your own or replace the ones you have.
- ▶ Icon & Cursor Animator: You're the artist, editor and director of your own icon and cursor movies.
- ▶ Sound Effects Player: Make your desktop sing. Or talk. Or shake, rattle and roll. Attach sounds to animations or events.
- ▶ Program Launcher: Put your favorite programs into a Mac-like custom pull-down menu for fast track launching.
- ▶ Wallpaper: Replace your desktop with classic scenes from famous movies.
- ▶ Icons & Cursors: Choose from hundreds of free icons and cursors to replace the ones that came with your programs. They're informative, racy and silly.
- ▶ Animations: Loads of fascinating animated icons and playful cursors make your desktop instantly fun.
- ▶ Sounds: Dozens of sound effects you can play whenever you want - right through your PC speaker.



Thrills, chills, sound & motion. *Animated Desktop* is the amazing icon and cursor animator! Only $59.95 SRP.

You can't work all the time. Make your PC fun even when it's just sitting there. Your desktop becomes an animated fantasy world of your own design with DeltaPoint Animated Desktop.

For the Windows user who has everything...but *fun*.

Bring your Windows desktop to life with colorful animation!

See your software reseller or call DeltaPoint®

1-800-446-6955

DELTAPOINT

ANIMATED DESKTOP™

FOR WINDOWS™

System Requirements: IBM AT or PS/2 (286 or higher) or 100% compatible (or any personal computer capable of running Microsoft Windows 3.0 or later), a minimum of 2 MB of available memory (RAM), 2 MB of free disk space, and a CGA, EGA, VGA screen or higher, (VGA or higher recommended). Requires Microsoft Windows 3.0 (with Multimedia Extensions) or later and DOS 4.01 or higher. A Windows compatible pointing device (mouse) is also recommended. Includes PC speaker driver for sound effects, Windows Multimedia Extensions or Windows 3.1 compatible sound board is optional.

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Circle 113 on reader service card

Turn a Word Processor Into a Contact Manager With Office Accelerator

Office Accelerator 2.0 lets you create a database of contacts that you can call up from within your word processor. The $129.95 product uses the information you enter into its database, called the Phone Book, to create instant documents, including letters and faxes.

You can install *Accelerator* so it appears in the menu bar of three *Windows* word processors: *WordPerfect for Windows 5.2*, *Microsoft Word for Windows 2.0*, and *Ami Pro*.

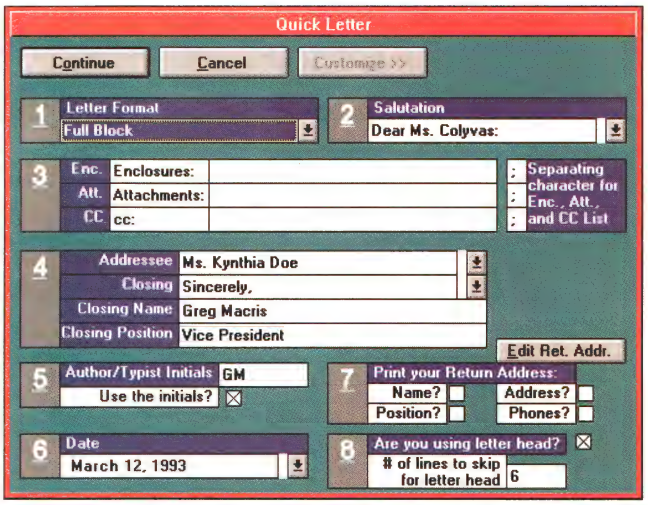
To get rolling with *Accelerator*, you create the Phone Book database record by entering a contact's name, address, title, company, and phone and fax numbers. You can write notes about a particular client and tag the entry. You can search entries by name, company, or category.

A Quick Letter feature lets you select a Phone Book entry and customizable preformatted letters with the date, address, salutation, and closing.

After you've composed your document, you can use *Office Accelerator* to address an envelope and create mass mailings. You can create faxes the same way—choose a name from your Phone Book, and the program will create a fax cover sheet that's filled out; if you have *Delrina WinFax* fax software, *Office Accelerator* will even transmit the fax for you.

To speed up your work, use *Office Accelerator* to replace your Rolodex file and simplify mailings and faxes.

—Laurianne McLaughlin



THE QUICK LETTER FEATURE of Office Accelerator 2.0 lets you select a phone book entry and preformatted letters.

Office Accelerator 2.0

WINDOWS **Create and use a personal phone book from inside your word processor to set up letters, envelopes, forms, and faxes.**

Baseline Data Systems
310/214-8528,
310/214-8259 (fax)
List price: $129.95
Reader service no. 699

Organize Your Documents

Direct Access Desktop is a *Windows* desktop utility that organizes your work into nine "virtual desktops" while providing virus protection and backup features.

Direct Access replaces *Windows'* Program Manager with what it calls the Control Room, a series of nine desktop choices. You fill a desktop with all the work you want in one place; for instance you could create a "reports" desktop with the data files and applications needed to complete a report. Just click on the desktop to launch all the applications.

You also get more control over files with *Direct Access*'s File Manager replacement, which lets you select files from several directories at the same time.

The virus scanner, Search and Destroy, scans and removes 1500 viruses.

A pared down version of Fifth Generation's *Fastback Plus* backup utility is also included.

—Laurianne McLaughlin

Direct Access Desktop

WINDOWS **A Program Manager replacement that includes a backup utility and virus protection.**

Fifth Generation Systems
504/291-7221
List price: $149
Reader service no. 700

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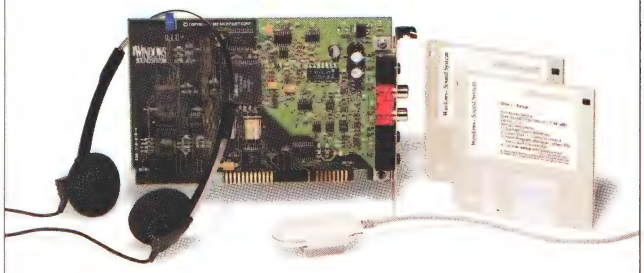

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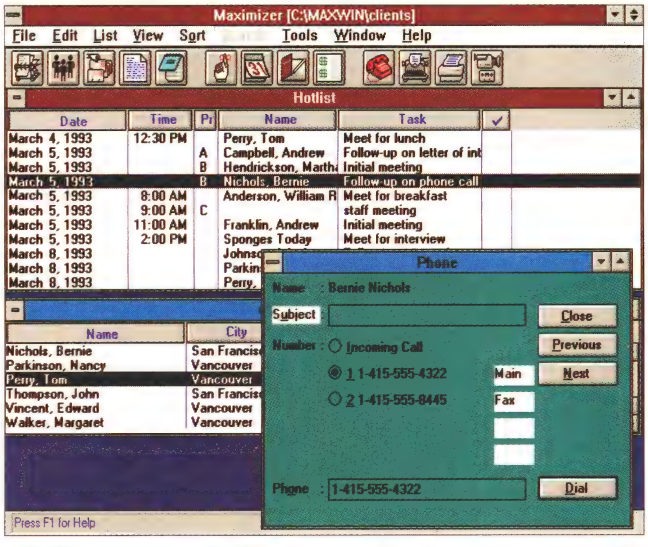
Maximizer for Windows Gives You the Contacts



EXECUTIVE POWER ON CALL. When you're ready to phone a client, Maximizer for Windows graphically presents the information you need.

Maximizer for Windows is a contact manager with an integrated scheduler. Support for DDE links to major fax and word processing applications lets you integrate the product into your everyday suite of applications.

You start using *Maximizer* by building a list of Clients—companies or individuals. When multiple individuals are associated with a specific Client, you start an accompanying Contacts database.

The Client database is the information hub in *Maximizer*. When you plan a meeting or initiate an action such as making a phone call or writing a letter, you select the contacts from the Clients database, then select the action. Thanks to the links between contact and action, when you send a letter or place a call, *Maximizer* finds the contact's address or phone number automatically.

You'll probably spend most of your time in *Maximizer* working from your Hotlist, a list of contact management tasks, such as writing a letter or sending a fax, keyed to a contact and a date (you can also list personal tasks here). The Hotlist wields power through the links you created earlier between contact and action. If the Hotlist says you have to fax a letter to someone, you can launch the applications you need from within the Hotlist; in turn, the Hotlist will put the contact information where you need it.

Maximizer supports three of the major *Windows* word processors—*Ami Pro, Word,* and *WordPerfect*. And you'll enjoy the luxury of paperless faxing from within *Maximizer* with *Eclipse Fax* or *WinFax Pro*. *Maximizer* works with other fax programs in addition, but not as seamlessly.

Maximizer has its own word processor, but it also provides blank letters in *Ami Pro, Word,* and *WordPerfect* formats with DDE links to the appropriate fields in *Maximizer*. You can highlight a contact in *Maximizer*, open the blank document for your word processor, and see your client's name, address, and salutation as well as the date all arranged for you in a business-letter format.

—Melissa R. Riofrio

Maximizer for Windows

WINDOWS Integrates a contact manager, a scheduler, and your applications.

Richmond Technologies & Software Inc.
800/663-2030,
604/299-6743 (fax)
List price: $249
Reader service no. 701

FontChameleon Provides Millions of Fonts

In the 1951 movie "The Man in the White Suit," Alec Guinness plays an idealistic inventor who develops a fabric that never gets dirty or wears out. But management and labor, sensing impending unemployment, grow irate and attempt to destroy both Guinness and his invention.

With *FontChameleon*, Ares has created a font equivalent of the "White Suit": a single master font that can mimic—with uncanny accuracy—more than 200 of the world's most popular text fonts.

In addition to creating the font of your choice (in TrueType Type 1 format) and installing it on your system, you can blend fonts. For instance, you can choose a sans serif Helvetica look-alike as the "base" font and a serif Courier as the "blend" font and, using the provided slider, create a hybrid of the two. You can also choose the degree of blend between light and boldface versions of a font to create any number of intermediate weights. For the intrepid type designer, it's easy to condense, extend, or alter the x-height of a font, and an on-screen preview lets you examine your designs as you create them. With all the blends and alterations available, *FontChameleon* has the potential to create millions of fonts—all fully hinted.

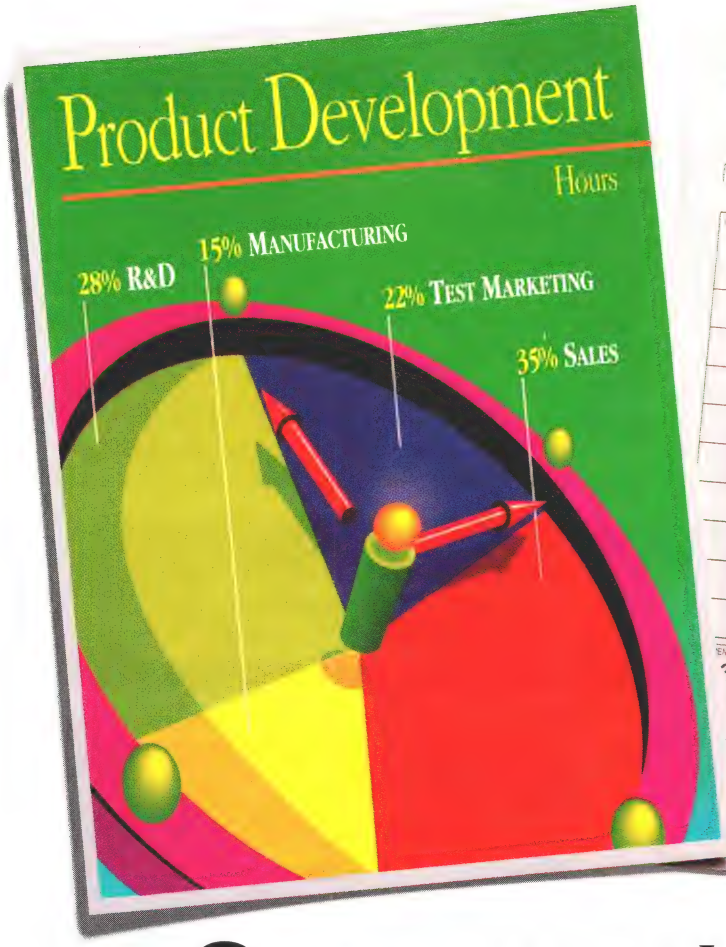
The $295 program, which requires *Windows 3.1*, is just 700K, and the font outline description files are a mere 2K each. This economy allows you to design your font, name it, store its description file, then build and install the full-size font file when you need it. Ares is also releasing *FontChameleon* on the Macintosh, and all description files are interchangeable between the *Windows* and Macintosh platforms.

—Steve Fox

FontChameleon

WINDOWS Lets you mimic 200-plus standard text fonts and create millions of original font designs—all with point-and-click ease.

Ares Software Corp.
800/783-2737,
415/578-9090,
415/378-8999 (fax)
List price: $295
Reader service no.702



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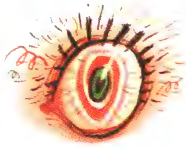

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The Phaser 200 is compatible with virtually any business software and can print two colorful pages per minute. No, not two minutes per page—two pages per minute. And even at a speed like that, it still manages to print eye-catching color on common laser paper or transparencies using a separate input tray for each. You select the medium you want at your computer keyboard. And it switches automatically from user to user just as easily, using its parallel, serial, AppleTalk,™ or optional EtherTalk™ and Ethernet™ ports.

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Circle 124 on reader service card

Farallon Brings Peer-to-Peer Networking to Windows PCs, Macs

The walls separating PCs and Macs continue to crumble. Two new networking packages, Farallon Computing's *Timbuktu for Windows 1.0* and *Timbuktu for Macintosh 5.0*, let *Windows* and Mac users exchange files, share printers, and remotely control other PCs and Macs on the net. Even more impressive, you do not need a LAN administrator to install *Timbuktu*, and it does not require a file server.

Macintosh users are familiar with *Timbuktu*, Farallon's remote control software praised for ease of use and installation. The new *Windows* and Mac versions retain that simplicity while adding powerful screen sharing and remote access features you won't find elsewhere.

Supports NetWare, Ethernet

Timbuktu for Windows 1.0 and *Timbuktu for Macintosh 5.0* run under NetWare and work with over 25 ethernet, token ring, and Apple LocalTalk LAN adapters, ensuring compatibility with the most common networking software and hardware. (However, before you install *Timbuktu*, check to see whether the program supports your company's LAN boards.) In addition, *Timbuktu* works with Microsoft's *Windows for Workgroups* peer-to-peer operating system, although some features are incompatible with *WFW*, according to Farallon.

The minimum configuration for *Timbuktu for Windows* is what you'd expect for any *Windows* package: a 386SX PC with 4MB of RAM, *Windows 3.1*, DOS 5.0, a VGA display or better, and a memory manager such as *EMM386*, *386Max*, or *QEMM* to load the program into high memory. Each workstation needs its own copy of *Timbuktu*, which lists for $199.

PC-to-Mac Connection

You install *Timbuktu for Windows* as you would any other *Windows* program—there's no need for approval from the LAN administrator. You also have to install Farallon's *PhoneNet PC* software, which is included with *Timbuktu*. You can configure *Timbuktu* to load automatically when you start *Windows*, or you can run it by double-clicking the *Timbuktu* icon in Program Manager.

The main screen lists other *Timbuktu* users whose computers you can access. One handy touch: The program displays different icons for Macs and PCs—convenient for *Windows* users who are looking to run a Macintosh application remotely. Click on one of four connection buttons to control another *Timbuktu*-equipped PC, view a screen remotely, or send and exchange files.

Snoop-Proof

But what if you don't want everyone snooping around your hard drive? Fear not, *Timbuktu* lets you assign each user passwords for specific tasks or deny access altogether.

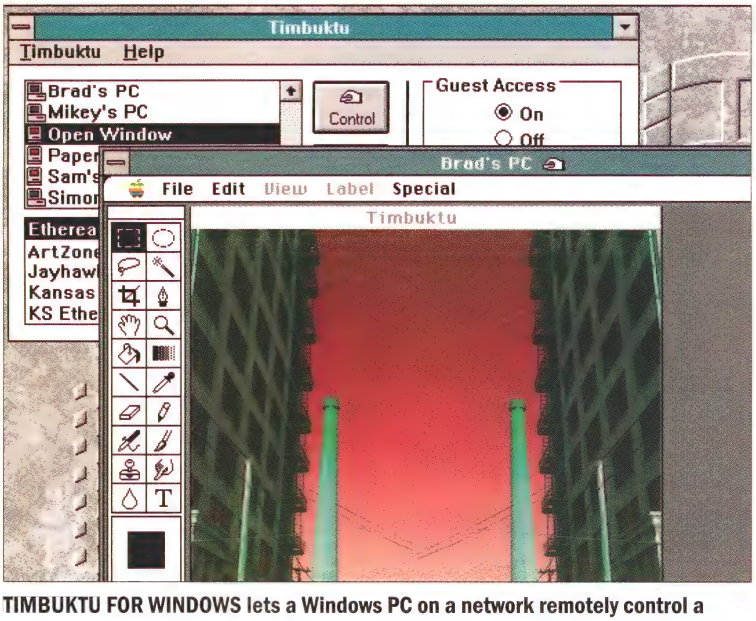
When another user is accessing your PC remotely, *Timbuktu* displays a flashing icon in the lower right corner of your screen. An "observer" icon (a face) means that a user is viewing your screen remotely, while a mail-slot icon tells you a user is sending you an electronic file.

When you use *Timbuktu* to access another PC, the program displays the host's screen on your monitor in a resizable window. When you're controlling a PC remotely, you can operate the host's computer with your mouse and keyboard—a powerful feature for running Mac applications under *Windows*, and vice versa.

If you are merely observing a remote PC rather than controlling it, you can watch while the host does the work. Mac users can display color screens and presentations on *Windows* PCs without first converting image files—always a tedious process. And *Windows* users can review high-quality graphics with Mac users in real time across the LAN. Plus Macintosh users with high-speed modems can dial in and control either Macs or *Windows* PCs on the LAN. Unfortunately, *Timbuktu for Windows* doesn't support remote communications, although Farallon says it plans to add that capability to future versions of the product.

While the new *Windows* and Macintosh versions of *Timbuktu* aren't cheap, at $199 per workstation, both are available in 10-pack, 30-pack, and 100-pack units, with volume pricing as low as $55 per copy, according to Farallon. *PhoneNet Talk* users can upgrade to *Timbuktu* for a list price of $59.

—Jeff Bertolucci



TIMBUKTU FOR WINDOWS lets a Windows PC on a network remotely control a Macintosh, provided the Mac also has Timbuktu installed.

Timbuktu for Windows 1.0, Timbuktu for Macintosh 5.0

WINDOWS **Two new file sharing and remote control programs that let Macs and PCs share data.**

Farallon Computing
510/596-9000,
510/596-9023 (fax)
List price: $199
Reader service no. 703

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Circle 244 on reader service card

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Circle 21 on reader service card

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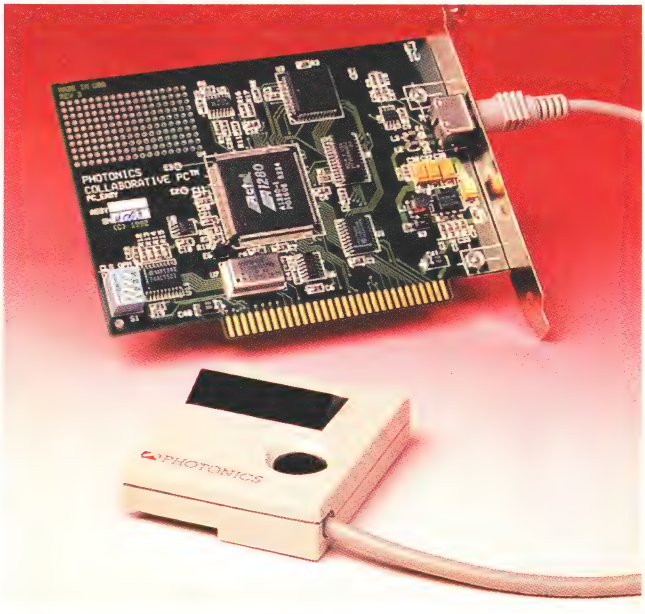
Photonics Brings a Light Touch to Wireless LANs

Wireless networks continue to improve in performance and drop in price. They can be lifesavers when wiring proves too expensive or difficult, or in conventional offices where a mobile, notebook-toting work force makes a wired LAN impractical.

Among the new breed of wireless LAN products is Photonics' Collaborative series of transceivers, which use diffuse infrared technology to transmit data in a 30-by-30-foot area.



PHOTONICS' COLLABORATIVE PC wireless LAN uses diffuse infrared light to transmit data at speeds up to 1 megabit per second.

Unlike conventional infrared transceivers that require an unobstructed path to transmit or receive data, the Collaborative bounces its signal off walls, ceilings, and floors, which means that you don't have to aim the device. The signal cannot penetrate objects, however.

The Collaborative's 1-megabit-per-second transfer rate is faster than that of the similarly priced Proxim RangeLAN, a 242-kilobit-per-second wireless LAN that uses spread-spectrum radio technology. (The RangeLAN, however, has a far greater range, with a broadcast radius of 800 feet.) The Collaborative also includes drivers for two major network operating environments, Novell NetWare and *Microsoft LAN Manager*.

Each Collaborative adapter consists of two components—a 2-by-2-inch external transceiver, and an internal or external connector for the PC.

Initially, two versions of the product will ship: The Collaborative PC comes with a PC add-in card that connects via cable to the transceiver; the Collaborative Port includes an external adapter that connects between the parallel port and the transceiver. (The parallel port restrains the external model's throughput to a slower 500 kilobits per second, according to the company.) Both products are scheduled to ship in March and will list at $250.

—Jeff Bertolucci

Collaborative PC, Collaborative Port

A series of wireless networking products that use diffuse infrared technology to transmit and receive data.

Photonics Corp.
408/955-7930,
408/955-7950 (fax)
List price: $250 each
Reader service no. 704

QmodemPro: Gather E-Mail From Any Source

QmodemPro is a completely rewritten commercial version of *Qmodem*, the popular DOS shareware program that has long been a favorite of BBS users.

Intuitive but also powerful, *QmodemPro* now sports an easy-to-use interface with drop-down menus, mouse support, and resizable windows.

A key addition is *Off-Line Xpress*, an off-line mail reader, also sold separately. Combined with major enhancements to *Qmodem*'s dialing directory, *OLX* automates most telecommunication activities.

For instance, using *QmodemPro*'s enhanced telephone directory, you can group-dial a list of on-line services to make your morning E-mail run. When you use a group-dial entry, *QmodemPro* will dial—and redial—multiple on-line services, including CompuServe, MCI, and BBS's, automatically sign on to the different systems, and check your E-mail. It will download your E-mail into a mail packet and sign off the system. You can then use *OLX* at your leisure, avoiding expensive connect charges.

OLX bundles your E-mail answers into a reply packet. Next time that you're on line, *QmodemPro* will post all your replies, sending each message to the service each addressee used; you can redirect a message to a fax machine or alternate BBS. If you use *QmodemPro* under *Windows*, you can do it all in the background.

QmodemPro also includes an editor, a spelling checker, and automatic address-book entry. It supports ten transfer protocols, including ZMODEM, YMODEM, XMODEM, Kermit, and CompuServe B+, and offers 14 terminal emulations and a powerful scripting language.

With this version, *Qmodem* becomes a real pro.

—Jim Moody

QmodemPro

This venerable shareware product goes commercial with powerful easy-to-use features.

Mustang Software, Inc.
800/999-9619,
805/395-0223
List price: QmodemPro $99 (includes Off-Line Express), Off-Line Express $40
Reader service no. 705

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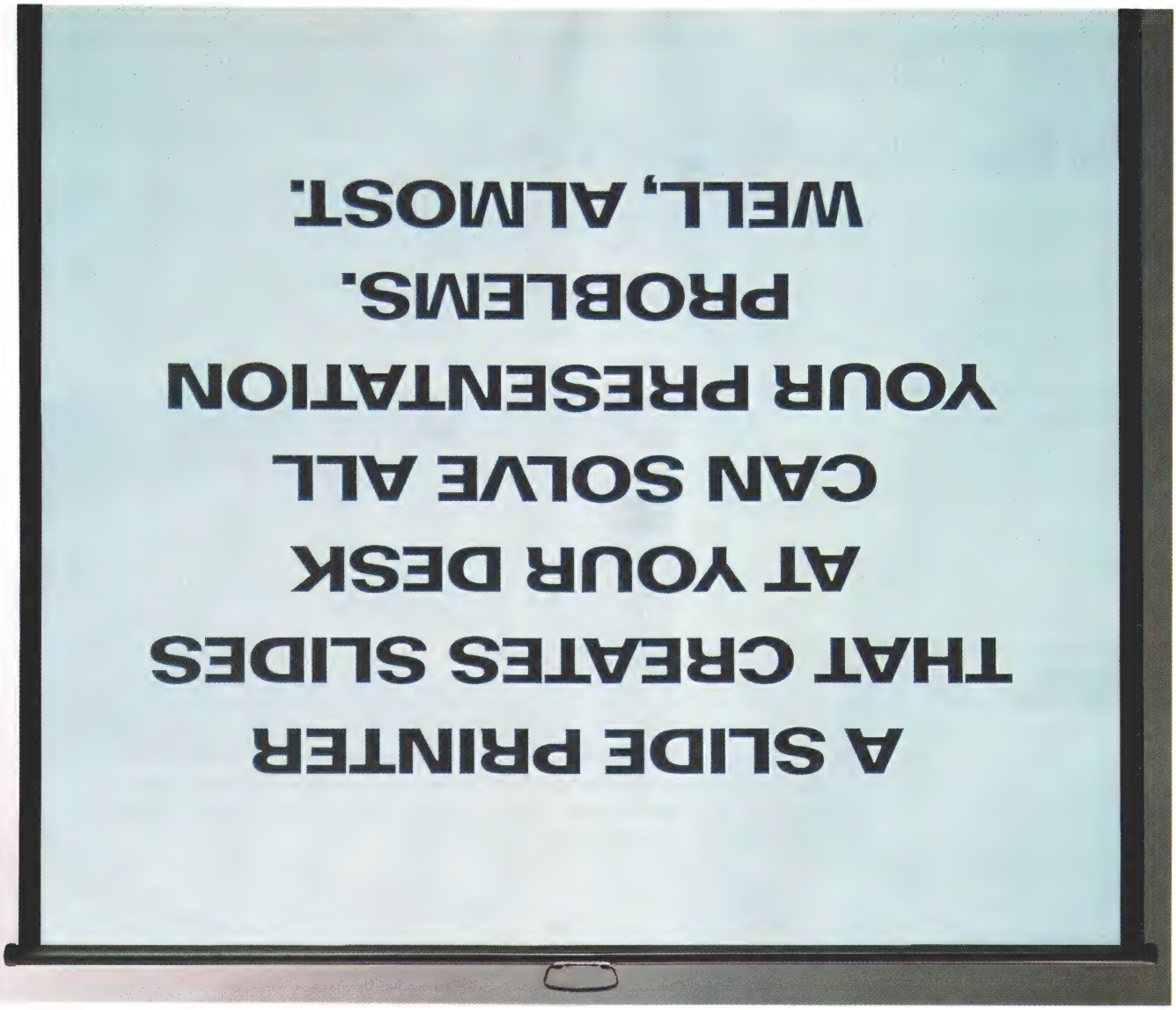

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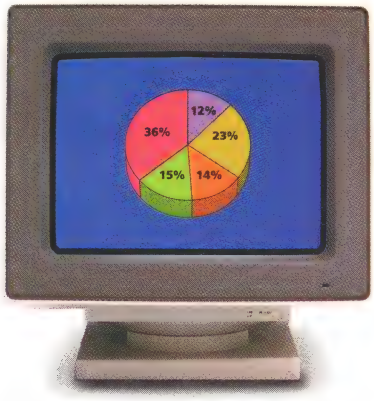
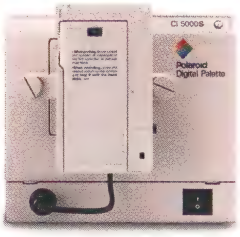
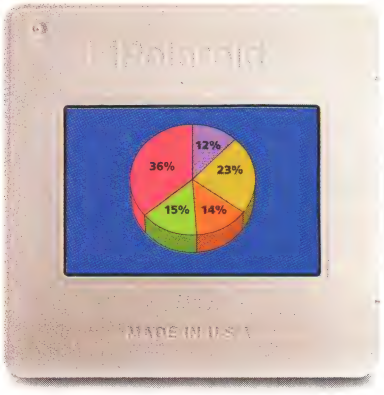


THE POLAROID
35mm SLIDE PRINTER





With the Polaroid 35mm Slide Printer, you can go from Windows, DOS or Macintosh graphics to slide film in minutes.

Polaroid

Circle 223 on reader service card

Digital Devices Outrace High-Speed Modems

Digital telephone phone lines, including ISDN and switched digital, offer faster throughput and are less susceptible to noise than conventional analog lines. With their capability to transmit uncompressed data faster than 56 kilobits per second (kbps), digital phone lines represent the future. Unfortunately, they haven't been available in many U.S. cities until recently. That situation is changing; many regional phone business and home customers are creating a market for high-speed, digital communications devices that replace the modem.

Why bother to replace the modem? Currently, the standard for high-speed modems is 14.4 kbps, much slower than digital offers. And while data compression can boost modem throughput significantly, line noise can slow transmission, forcing your high-speed modem to operate at 9600 bps—or even slower.

Digital lines represent a faster, more reliable solution, particularly for small branch offices that are remotely linked to the LAN back at headquarters.

BRI LAN Adapter

Extension Technology, a start-up in Framingham, Massachusetts, is targeting its new Basic Rate ISDN (BRI) LAN Adapter at this branch office market. This $1895 16-bit PC add-in card works with a basic-rate ISDN digital telephone line, transmitting over ISDN's two 64-kbps channels for a maximum data throughput of 128 kbps. The card is compatible with ethernet and token ring networks, and comes with drivers for Novell NetWare 3.1 and *NetWare Lite*, the company says. (You'll need a BRI LAN Adapter card plus an ISDN line at both your office and the remote site.)

Larger sites would probably benefit from an expensive (and complex) digital link involving leased lines, bridges, and routers. And while the BRI LAN Adapter offers higher data rates than conventional modems, it lacks a compression scheme to boost throughput—a feature that the manufacturer says it's working on.

Desktop Conferencing for Windows

Fujitsu Networks Industry has work group computing in mind with its new Desktop Conferencing for *Windows 3.1*, a $1995 ISDN add-in card with *Windows* software for remote presentations, project reviews, training, and other applications.

UDS MOTOROLA'S DIGITAL MODEMS use high-speed digital phone lines, yet they plug into any standard serial port. They will run off-the-shelf DOS and Windows communications software.

Operating at speeds up to 64 kbps, Desktop Conferencing lets users in remote locations simultaneously view, modify, and annotate spreadsheets, documents, and other data within *Windows 3.1*.

Fujitsu's optional light-pen computing pack ($397) provides a hand-held pointer for making changes directly on screen—which remote users can see and respond to immediately. Fujitsu officials view Desktop Conferencing as a useful tool for group project editing when employees are scattered in different cities.

Digital Modems

UDS Motorola has taken a slightly different approach with its new line of digital modems. These high-speed digital devices resemble external modems. They plug into the serial port of your PC but connect to digital lines such as ISDN and switched digital to offer speeds up to 56 kbps. (Check with your local phone company to see which digital services are offered in your area.)

While UDS Motorola calls these digital devices "modems," in fact they're not, since they use a digital phone line and don't perform the modulate/demodulate tasks of conventional modems. The company has done a good job, however, of making them as modem-like as possible. They connect to a serial port, and run off-the-shelf, Hayes-compatible software such as *Crosstalk* and *Procomm Plus*. Prices range from $1150 to $1395, depending on the type of digital line you use.

Digital modems are targeted at telecommuters and branch offices—actually any remote user who needs a high-speed network link. A word of caution, however: Older PCs, particularly 286s and earlier, may have serial ports limited to speeds that are under 20 kbps. Check to make sure your system can handle a high-speed link. Or consider buying a serial upgrade card for about $200.

—Jeff Bertolucci

BRI LAN Adapter, Desktop Conferencing for Windows 3.1, UDS Motorola Digital Modems

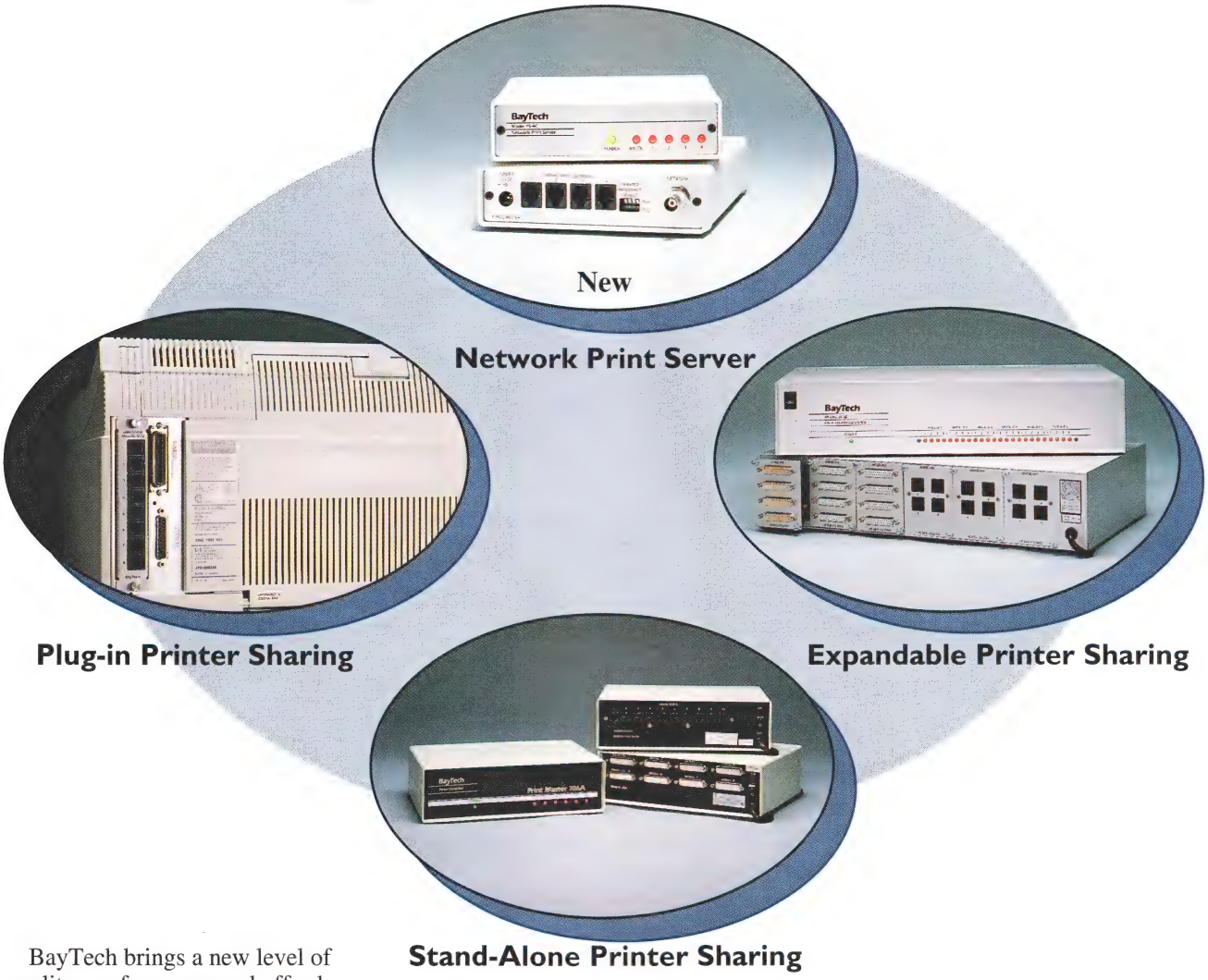
Three high-speed, communications devices replace conventional modems by using digital phone lines.

Extension Technology Corp.
508/872-7748
508/872-7533 (fax)
List price: $1895
Reader service no. 706

Fujitsu Networks Industry
800/446-4736
203/326-2701 (fax)
List price: $1995
Reader service no. 707

UDS Motorola
205/430-8000
205/830-5657 (fax)
List price: $1150 to $1395
Reader service no. 708

Making The Best Better



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- *Plug-in printer sharing*
- *Modem sharing*
- *Network print servers*
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800-523-2702

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Expert Ease 1.01

WINDOWS For *Excel 4.0* fans who want more tools and functionality, there's *Expert Ease 1.01*, an add-in package of 15 general utilities. The most ambitious of the tools, the Database Wizard, presents users with a series of dialog boxes offering step-by-step instructions on how to define a database, set up criteria, and select the fields to extract. Other tools, whose icons appear in their own customizable tool bar or as menu items, let you print multiple documents from a pick list; display such cell statistics as SUM, MIN, MAX, and so on; paste in the date and time; change the case of selected cells; multiply or divide groups of cells; and delete and append text from the beginning or ending of text strings in highlighted cell ranges. Expert Ease retails for $69.95. Black Mountain Software, 619/672-9850.

Reader service no. 709

CompuAdd 425C Color Notebook

CompuAdd's 425C color portable will not strain your budget (it costs only $2595) or your carrying arm (it weighs only 5.9 pounds). The system's Cyrix 486SLC-25 processor runs at 12.5 or 25 MHz. The unit has an 80MB hard drive, 4MB RAM, and a built-in trackball. Its 8.5-inch, passive-matrix color LCD screen displays standard VGA resolution of 640 by 480 with 16 colors. Its 15-pin VGA connector supports external monitors with resolutions up to 800 by 600. The system holds two rechargeable nickel-cadmium batteries. CompuAdd says that you can use the system for 2 hours continuously, or longer if you use the built-in power management features. CompuAdd Corp., 800/627-1967.

Reader service no. 710

Norton Commander for OS/2

Norton Commander for OS/2 is a networkable file management program from Symantec that lets you manage files from one central window on your PC. A graphical tree and file list show you what's inside folders and drives. For locating files, the global find utility searches for files by name or extension and displays findings in a scrollable list. You can launch or view files from the list and view multiple folders at once. The program requires OS/2 2.0, 500K hard disk space, and 4MB RAM. It lists for $149. Symantec Corp., 800/441-7234.

Reader service no. 712

Zeos 486 EISA Systems

Zeos Int'l continues to fortify its line of upgradable desktops with the addition of three EISA bus PCs. The new 486DX-33, 486DX2-50, and 486DX2-66 can all be upgraded with Intel's Pentium-based OverDrive processor. Other features include a ZIF socket for easy processor upgrades, a 256K memory cache, and flash BIOS for simpler BIOS upgrades. List prices include the monochrome monitor. 486DX-33 $1995, 486DX2-50 $2195, 486DX2-66 $2395. Zeos Int'l, 800/423-5891.

Reader service no. 713

Tektronix Phaser Printers

If you like thermal wax color printers but hate their slow speed and special paper requirements, take note. Tektronix now has two thermal wax color printers, the Phaser 200i and Phaser 200e, that print two pages per minute, a speed the vendor claims is twice that of other thermals. The printers use a new technology that relies on Tektronix's plain-paper thermal transfer process to produce 300-dpi color images on common office paper instead of on more costly, specially coated paper. In addition, both devices print on transparencies. They also sport standard communications connections. Phaser 200i $5995, Phaser 200e $3695. Tektronix Inc., 800/835-6100.

Reader service no. 721

THE NEWSCARD IS THE PCMCIA VERSION of Motorola's NewsStream receiver, a one-way paging device that lets you receive E-mail, computer files, and other data while on the road.

Motorola NewsCard

Motorola has shrunk the size of its NewsStream receiver and labeled it NewsCard. This one-way paging device is tiny enough to fit into the PCMCIA Type II slots appearing in the latest notebooks, subnotes, and hand-held PCs. Like NewsStream, its older and larger sibling, NewsCard is designed to work with one-way paging and messaging networks like BellSouth's MobileComm and Southwest Bell's Metromedia paging systems, as well as Motorola's own Embarc E-mail network. Mobile execs can receive notice that a message has arrived, then download full-text messages or data into their PCs. The NewsCard is powered by a standard AA-size alkaline battery that will run the unit for 30 days, Motorola says. Company officials expect the NewsCard to cost under $400. Motorola Paging and Wireless Data Group, 407/364-2000.

Reader service no. 715

BCC's 486SLC Notebook

Not only is BCC's new Avanti 486 notebook sleek on the outside, it has numerous performance improvements on the inside. The Avanti 486 sports a 25-MHz Cyrix 486SLC-25 processor, a math coprocessor, and advanced power management. It weighs 6.4 pounds with the battery and measures 11 by 8.5 by 1.7 inches. The vendor claims a battery life of 4 to 8 hours and a battery recharge of under an hour. The notebook also has a 9600-/4800-bps send/receive fax-modem and a 10-inch backlit VGA LCD screen. The screen pivots up and down from the key-

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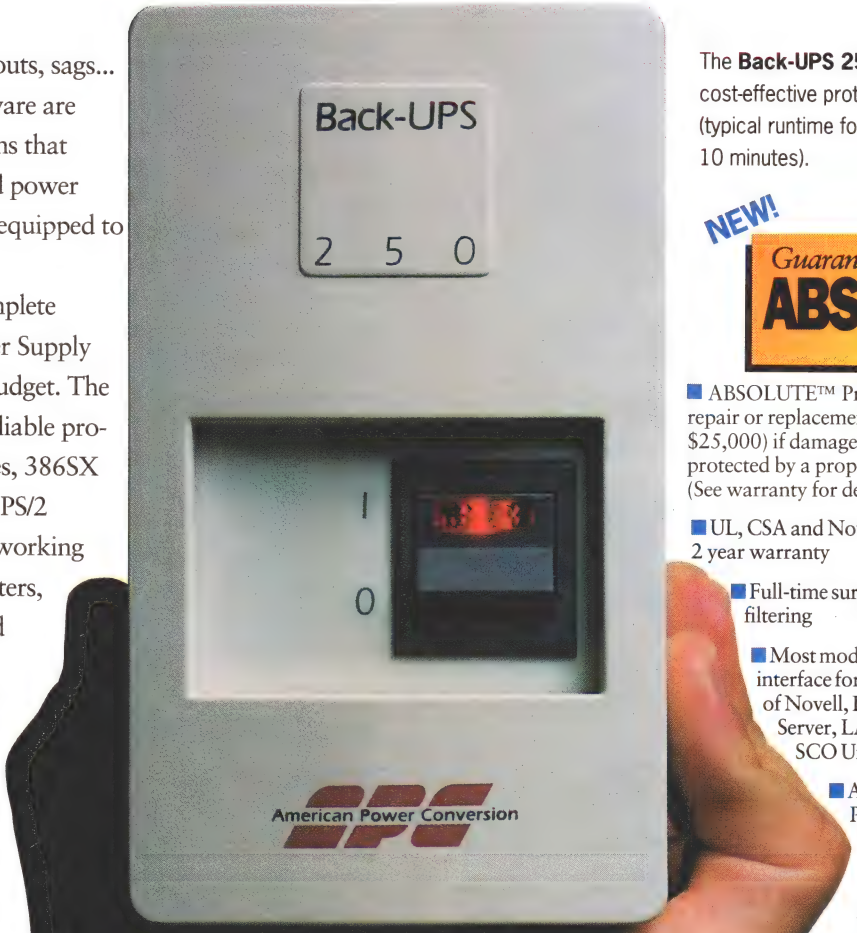

The **Back-UPS 250** offers even more cost-effective protection for LAN nodes (typical runtime for a 386SX system is 10 minutes).

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- 230V models available

LAN TIMES READERS CHOICE 1992

Computer Reseller News Editors' Choice

1991, 1990

Model	Application	List	New List
Back-UPS 250	LAN nodes, 386SX, 286, internet hardware, POS	~~$189~~	$139
Back-UPS 400	Desktop 386, 486 systems, 286 servers	~~$249~~	$229
Back-UPS 450	Tower 386, 486 systems, servers	~~$329~~	$279
Back-UPS 600	Heavily configured systems, CAD/CAM workstations	~~$449~~	$399
NEW! **Back-UPS 900**	Multiple systems, longer runtime applications		$599
NEW! **Back-UPS 1250**	Multiple systems, LAN hubs, small minis, telecom equipment		$799

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board to fit in close quarters. The system comes with 4MB of RAM, expandable to 8MB. Prices start at $2795. BCC, 408/944-9000.

Reader service no. 718

Quill EISA Systems

Mail-order shoppers looking for a high-end system have some new entrants to consider: Quill Corporation's Q-Tech EISA PCs. Quill systems come in four variations: 486DX-33, 486DX/2-50, 486DX-50, and 486DX/2-66. Each model includes an SVGA color monitor and 4MB of RAM, expandable to 28MB. External caches range from 128K on 33-MHz systems to 256K on 50- and 66-MHz units. Each system has a 200MB hard drive; higher capacity drives are available. For expandability, you can pick from optional tower models that offer six 5¼-inch drive bays, one internal full-height bay, and eight EISA slots; they come with 5¼- and 3½-inch floppy drives. From $2799 to $3149. Quill Corp., 708/634-6650.

Reader service no. 717

Schedule Express for Windows

WINDOWS This easy-to-use program makes it a simple matter for you to create visually striking, colorful diagrams of your schedules, whether for personal tasks, group projects, or companywide processes. The $129.95 *Schedule Express* is essentially a tool for creating Gantt and PERT charts. You can attach information to each object and call it all up with a mouse click, append notes to the chart, and assign personnel to each task. Need to see tasks assigned to an individual? You can sort the chart by person or type of object and display only those items. *Schedule Express* even lets you establish dependencies between objects, so you can include the requirement that one part of a project be finished before another can occur. Foundation Microsystems, 510/814-1695, 510/814-1696 (fax).

Reader service no.720

Microporte 4232bis With Fax

Microcom's cellular/land-line modem now has fax capabilities. The Microporte 4232bis With Fax incorporates MNP-10, Microcom's error correction protocol that ensures accurate data transmission over noisy cellular and land lines. This $899 portable unit sends and receives data at 14,400 bps and faxes at 9600 bps. Microcom, 617/551-1000, 617/551-1968.

Reader service no. 711

Lightning Omnicache 486-66

We couldn't find one for less at press time—a 66-MHz 486DX2 PC for $1895. The Lightning Omnicache 486-66 has 4MB of RAM, a 170MB hard drive, a *Windows* accelerator, and an SVGA monitor with 1024 by 786 resolution. You also get a 64K cache, expandable to 256K, and six drive bays. The Omnicache has a 1.2MB or 1.44MB floppy drive and an eight-slot ISA motherboard with an AMI BIOS. RAM expands to 32MB; EISA and local bus are optional. You can choose from seven case styles, graphics accelerators, tape drives, fax-modems, CD ROMs, and larger monitors. Prices start at $1895. Lightning Computers, 800/347-4486.

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For more information about any product, contact the manufacturer or circle the number on the reader service card.

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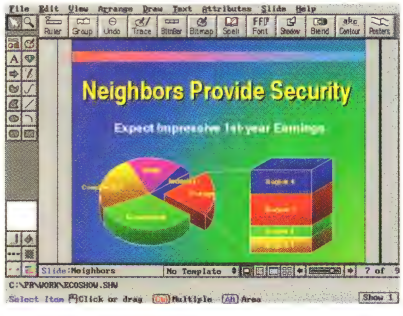
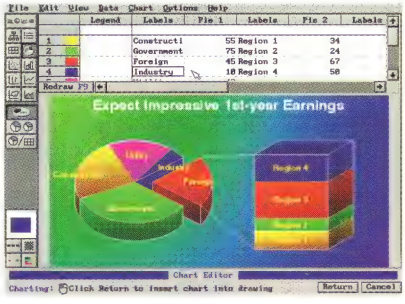


Our graphical interface brings Windows-like ease to DOS. And since our Windows version is almost identical, there's no learning curve if you move up.



Unlike other programs, you don't have to navigate back and forth between the data input screen and your chart. With the Split Screen Editor, changing the data on top instantly changes the chart below.

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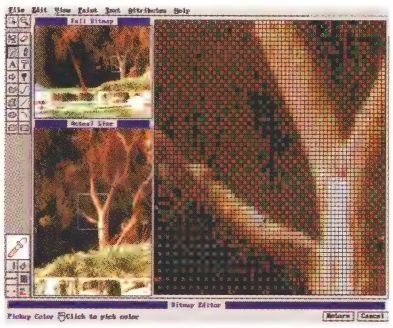

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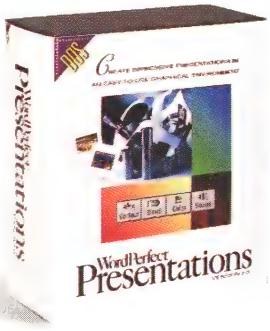

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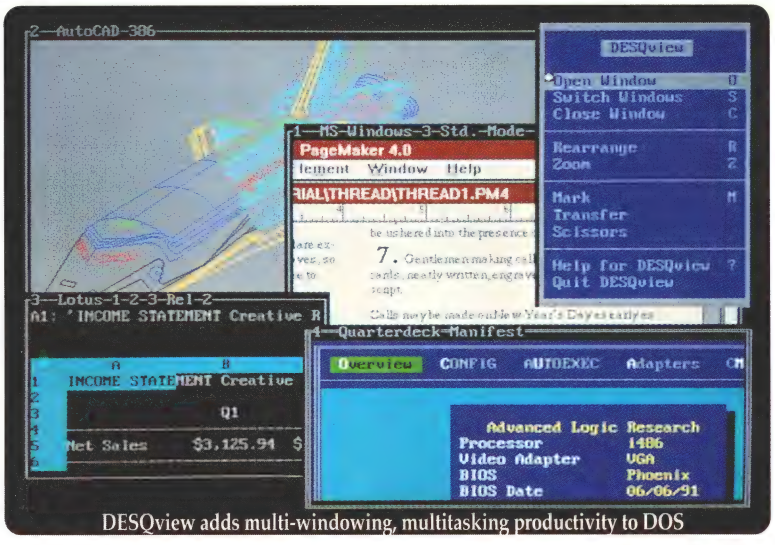
The death of DOS Has been greatly exaggerated

DOS is still the preferred operating system on over 80% of the PCs in Fortune 1,000 companies, according to recent studies.



DESQview adds multi-windowing, multitasking productivity to DOS

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Many Fortune 1,000 companies are using DESQview™ as the best solution for keeping the dependability and familiarity of DOS programs and adding multitasking, windowing productivity. DESQview users give up nothing—since it actually runs MS Windows better should users wish to run Windows programs.

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DESQview 386 gives you pre-emptive multitasking like OS/2, but with 1/20th of the disk space and 1/8th of the memory requirements. It gives you windowing like MS Windows, but with greater speed and efficiency and fewer 'crashes.' And DESQview lets you use a mouse or stick to the keyboard.

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We've never been confused about our role. We believe software companies exist to make your job easier and your working day more productive. When publishers step out of that mold and begin to tell you what hardware you need and that you should throw out somebody else's perfectly good software—well, they simply are not operating in your best interest.

Software publishers don't create standards. You do. And whatever standard you choose, we support it.

If you like a program that only runs in MS Windows, like Wordperfect for Windows, DESQview 386 supports your choice. If you prefer a spreadsheet that runs in DOS, Lotus 1-2-3 Release 3, for example, we support that too. In fact, DESQview 386 lets you run your favorite DOS and Windows programs side-by-side.

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DESQview 386 comes with QEMM-386, the number one memory management utility, and Quarterdeck Manifest, the award-winning memory analysis and monitoring program. Between them, they assure you every last 'K' of memory is put to use.* In many cases, QEMM can mean the difference between running the TSRs you want and not having enough memory.

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* DESQview makes multitasking and windowing available to users of 286-class machines with similar memory efficiencies through QEMM-50/60 for IBM™ PS/@ 50 and 60 users and QRAM for other 286 users.

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Circle 189 on reader service card

Marketplace

A Monthly Survey of Prices on Popular Models

Over the Counter

What you pay at retail stores for popular PCs

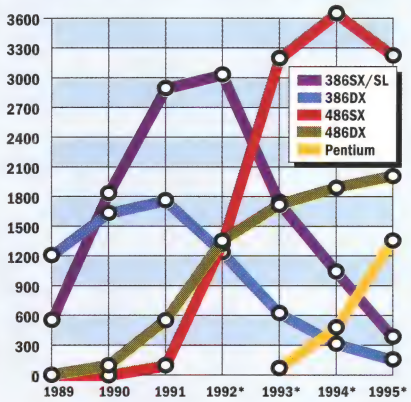
n/a = not applicable

	Configuration			National	
	CPU/speed (MHz)	RAM (MB)	Hard disk (MB)	List	Average street price
386SX/SLC-based desktop PCs					
ALR Flyer SC 3/33s	i386SX-33	2	80	$799	$720
Dell 333s/L	i386SX-33	4	120	$1200	$1200
Gateway 2000 25MHz 386SX	i386SX-25	4	80	$945	$945
IBM PS/ValuePoint 325T	IBM 386SLC-25	4	80	$1649	$1649
NEC PowerMate SX/25i	i386SX-25	2	60	$1299	$1116
386DX-based desktop PCs					
AST Power Premium 3/33	i386DX-33	4	210	$3095	$2611
Compaq Deskpro 3/33i	i386DX-33	4	120	$1979	$1834
Compaq Deskpro 386/33M	i386DX-33	4	120	$2569	$2319
DEC DECstation 333c	i386DX-33	4	245	$2300	$2300
486SX-based desktop PCs					
AST Bravo 4/33s	i486SX-33	6	218	$1995	$1787
Compaq Deskpro 486s/25M	i486SX-25	4	120	$2569	$2293
Compaq ProLinea 4/25s	i486SX-25	4	240	$1459	$1373
DEC DECpc 425sx LP	i486SX-25	4	245	$1849	$1849
Dell System 425SE	i486SX-25	4	200	$3100	$3100
Hyundai 433SP	i486SX-33	4	120	$1999	$1999
IBM PS/ValuePoint 425SX	i486SX-25	8	170	$1849	$1849
486DX-based desktop PCs					
AST Power Premium 486/33	i486DX-33	4	210	$3495	$2942
Compaq Deskpro 50M	i486DX2-50	8	340	$4469	$3977
DEC DECpc 466d2 LP	i486DX2-66	4	120	$2199	$2199
Dell 466/M	i486DX2-66	8	320	$3050	$3050
Gateway 2000 4DX2-66V	i486DX2-66	8	340	$2425	$2425
HP Vectra 486/33ST	i486DX-33	4	430	$5249	$4619
IBM PS/2 ValuePoint 433DX	i486DX-33	8	212	$2199	$2199
IBM PS/2 Model 90XP DX2-OLF	i486DX2-50	8	400	$5020	$4320
NEC PowerMate 486/50i	i486DX2-50	4	240	$2949	$2548
Portable PCs					
AST PowerExec 3/25SL	i386SL-25	4	60	$2395	$2169
Compaq Contura 3/25	i386SL-25	4	120	$2099	$1961
Compaq Portable 486c	i486DX-33	4	120	$6199	$5701
Dell 320SLi	i386SL-20	2	80	$2169	$2169
Dell System NL25	i386SL-25	2	80	$1649	$1649
Gateway 2000 Nomad 420SXL	i486SX-20	4	80	$1995	$1995
HP 95LX	NECV20-5	1	n/a	$799	$568
Hyundai Courier Spectra	Cyrix 486SLC-25	4	120	$2999	$2999
IBM ThinkPad 700	IBM 486SLC-25	4	80	$2750	$2562
NEC UltraLite SL/20	i386SL-20	2	80	$1699	$1444
TI TravelMate 4000WinDX	i486DX-25	4	120	$3299	$2978
Toshiba T4400C	i486SX-25	4	120	$3999	$3588
Toshiba T4400SX	i486SX-25	2	80	$2599	$2338
Toshiba T3300SL	i386SL-25	2	80	$2299	$2068
ZDS Z-Note 325Lc	i386SL-25	4	120	$3702	$3702

From a national survey of more than 180 dealers by International Data Corporation. Figures are based on at least four price quotes for each machine. Prices are based on manufacturer's standard configuration without monitor.

Declining 486 Prices Cut Into Sales of 386-Based Systems

Desktop PC purchases by processor (in thousands)



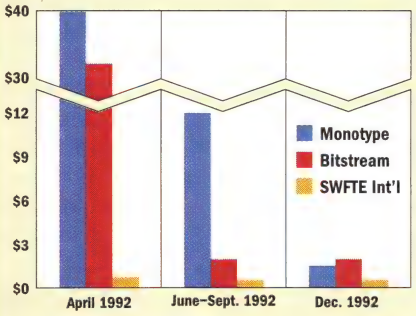
Currently the price difference between a 386 and a 486SX desktop can be as little as $100. As a result, in 1993 and beyond, 386s will be chosen by only the most price-sensitive buyers, says International Data Corporation pricing analyst Brian Clarke. From 1992 to 1993, sales of 386SX systems and 386DXs were expected to drop by 50 percent, says Clarke. At the same time, sales of 486SX systems could more than double this year.

***Projected**

Source: International Data Corporation

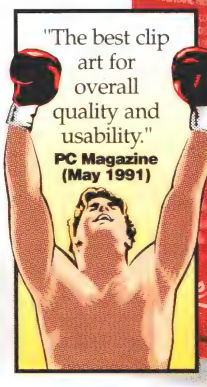
The Writing on the Wall: TrueType Prices Plummet

List price per typeface



The introduction of *Windows 3.1* with TrueType fonts in early 1992 and Microsoft's later rollout of low-cost font packs forced many font vendors to reconsider their pricing. While vendors offered fonts in small quantities previously, most now also offer volume value packs containing up to 40 typefaces at a lower price per typeface. For example, Bitstream's prices have dropped from $32.25 per typeface in spring 1992 to the current $2 per typeface in Bitstream's TrueType Font Pack 1.

Source: Vendor list prices



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PC Computing (May 1992)

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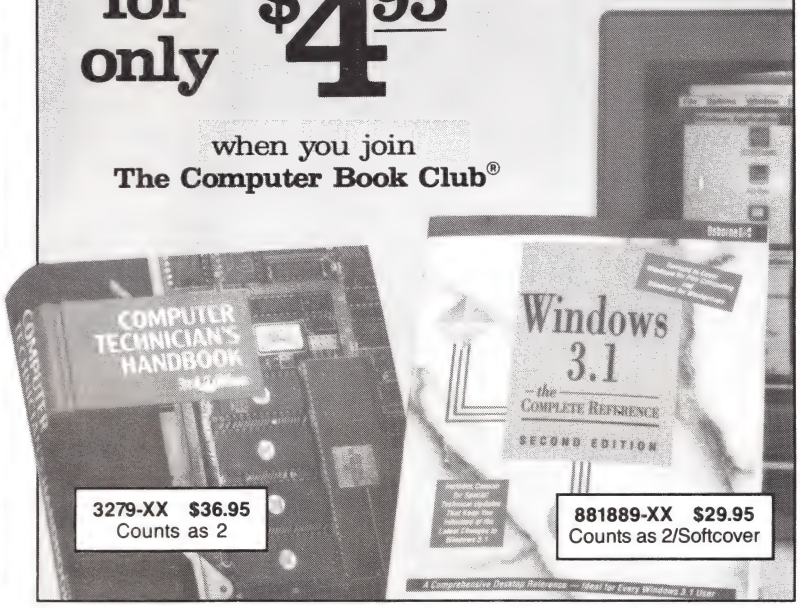

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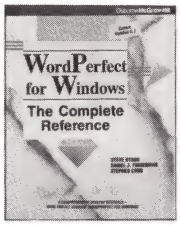

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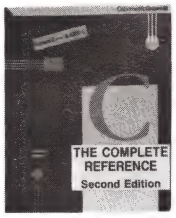

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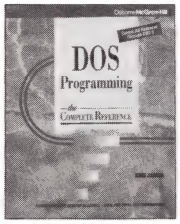

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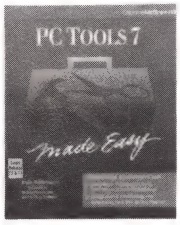

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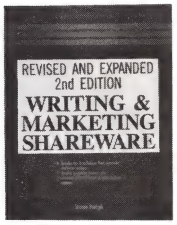

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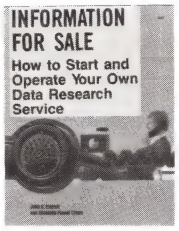

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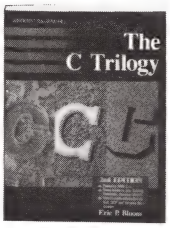

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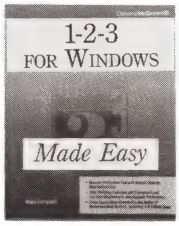

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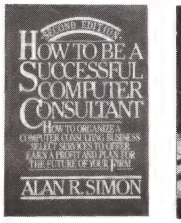

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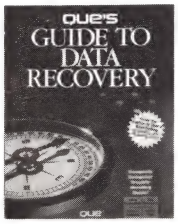

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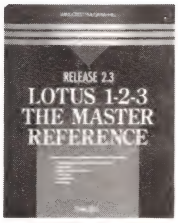

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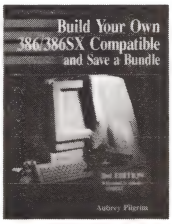

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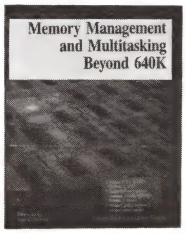

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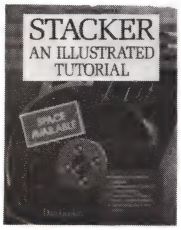

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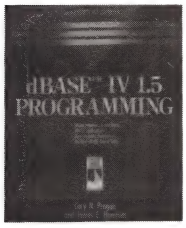

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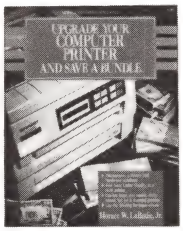

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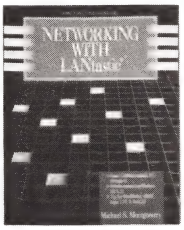

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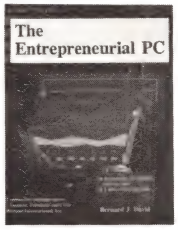

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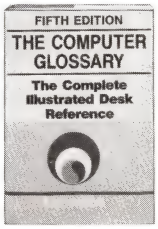

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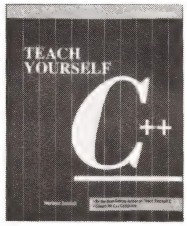

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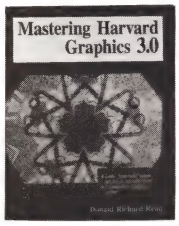

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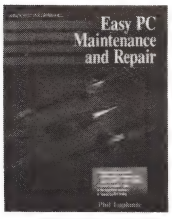

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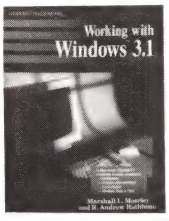

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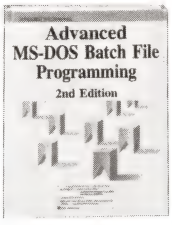

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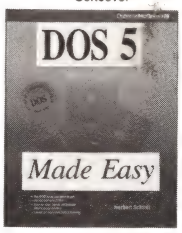

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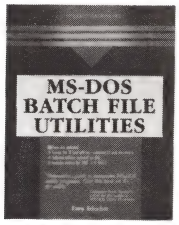

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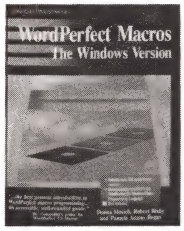

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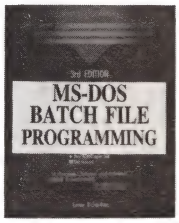

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486DX2-66s

FASTEST PCs IN THE UNIVERSE

Combining eye-popping prices with blazing speed, systems based on Intel's 66-MHz 486DX2 are the best buys around. Which of the hottest 24 systems we've ever seen do you want on your desktop?

By Owen Linderholm and Dan Miller

It's amazing what $3000 will buy these days. That's the average price of the 24 fully configured systems in this roundup, all of which boast the fastest 486 processor available—Intel's DX2-66. According to our tests, DX2-66 systems average 10 percent faster performance than DX-50s, 15 percent faster than DX2-50s, and 40 percent faster than DX-33s. Yet the average cost increase of DX2-66 PCs is less than the performance gain. For the first time in PC history, the fastest systems available are also the best values.

Of course, choosing your PC's processor is only half the battle. In this review, we'll let you know which of 24

OUR FIVE BEST BUYS offer the best all-around values. Clockwise from upper left: the Hertz 486/D66X2e, Tangent 466ex, Gateway 4DX2-66V, Axik Ace Cache 486DX2-66, and Lodestar 486LB DX2/66 Winstation.

PHOTOS: ROBERT CARDIN, GLOBE: WESTLIGHT STOCK

DX2-66 speedsters offer the best combination of performance, price, service and support, expandability, and design and which are the individual standouts in these areas.

Breaking the Land Speed Record

Our first step was to see how fast these systems really were. We ran each through an exhaustive round of speed tests, using both the primarily DOS-based BAPCo test suite (an industry-standard application-based benchmark) and our own PC World Test Center *Windows* benchmark suite.

The six fastest DX2-66 systems here are the fastest machines of any kind we've ever tested. The speed advantage of the DX2-66 is particularly noticeable on the BAPCo suite; all but three of the systems in this review were faster there than the fastest DX2-50 we've ever tested.

Despite the blazing speed of all these systems, there are significant differences among them. The slowest machine overall was some 40 percent behind the fastest. Why the big disparity?

The first and most important factor was the presence or absence of a caching disk controller. The four fastest systems in the review used caching controllers. The advantage was particularly noticeable on the software development portion of the DOS-intensive BAPCo suite. This set of tests is extremely disk intensive—even more so than database applications—and systems with caching disk controllers took the top eight spots. Caching controllers had far less impact on our *Windows* tests—except in the *Paradox*-in-a-DOS-window section—partly because the *Windows* tests use much more of a system's resources at once.

You don't need a large disk cache, either. In the machines we looked at, 512K or 1MB improved DOS and *Windows* performance significantly; moving from 1MB to 4MB produced far less dramatic improvements. Finally, disk caching alone doesn't guarantee top performance. The Quill system, with its 4MB caching controller, turned in comparatively poor results on many tests, although it did do somewhat better on several of the disk-based tests.

Best Buys

Not surprisingly, all our Best Buys are among the top speedsters in this review. All but the Gateway use caching disk controllers, and the Gateway uses a VESA local-bus controller that also speeds disk performance. The Hertz and Tangent systems include a whopping 4MB of cache memory on their drive controllers. The Axik won top honors by ranking in the top six in price, performance, and service and support. The Gateway also was a good all-around performer, although the company's service-and-support policies have started to drop below the average.

1. **Axik Computer Ace Cache 486DX2-66** (page 114)
2. **Gateway 2000 4DX2-66V** (page 117)
3. **Hertz Computer 486/D66X2e** (page 117)
4. **Tangent Computer Model 466ex** (page 120)
5. **Lodestar Computers 486LB DX2/66 Winstation** (page 118)

OUR OVERALL WINNER: Axik Computer's Ace Cache 486DX2-66.

A Fast Ride on the Local Bus

The second big factor in system speed, particularly for *Windows* applications, is the graphics subsystem. All these machines use graphics accelerators—they're standard equipment on most PCs these days—but vendors implement them in various ways.

The fastest systems have accelerators on the *local bus*—a high-speed circuit that lets the graphics system operate at the PC's clock speed (in this case, 33 MHz). There are currently two kinds of local-bus designs available—proprietary and VESA standard. Neither is intrinsically faster, but the VESA bus is a standard. Many card vendors are making VESA-compatible expansion boards for graphics, IDE or SCSI controllers (as in the Gateway and Tri-Star systems here), and networking. In the PCs we looked at, local-bus graphics systems performed up to 20 percent faster on the *Windows* tests than their ISA counterparts did; with character-based DOS apps, the difference was hardly noticeable.

Strangely enough, the performance of the local-bus systems varied widely, even when they used identical accelerator boards in an identical fashion. The disparities reveal a subtle performance element—software drivers. Drivers are programs that enable a system to communicate with its peripherals. How well a peripheral actually performs depends very much on the quality of its drivers. Local-bus technology is still new, and judging by the performance of the slower local-bus video systems in this review, many of the drivers for local-bus boards could be improved. Expect to see better performance from them soon.

Fast Caching for Memory

The third important factor in overall performance is the memory subsystem. All these systems were configured with 8MB of RAM

and, since all of them use the 486DX2-66, they all have an 8K cache inside the CPU. But they vary widely in the amount of secondary, external cache that vendors have added.

In the past, we've found that an external RAM cache consistently improves performance, but in this roundup the improvement was much less consistent because video and hard drive differences were more noticeable. Four of the five fastest systems in the review come with a 256K RAM cache, and the fifth (and fastest machine overall) has a 128K cache; similar numbers hold true, however, for the five *slowest* systems. Only one system had no external cache, and it finished in the bottom third.

Getting More for Your Money

We expected top speed from this group—but the prices were a big surprise. One system, from CAF Technology, sold for an amazing $2042 in our standard configuration—8MB of RAM, a 100MB or larger hard drive, two floppies, super-VGA graphics, a color monitor, serial and parallel ports, a keyboard and a mouse, DOS 5.0, and *Windows 3.1*.

Finding out the actual prices of fully configured systems was easy with direct-sale vendors—we simply called up and asked for quotes on our particular configuration. For systems sold through dealers, we estimated street prices based on vendor list prices minus the average street discount we've found for each vendor over the past six months. Prices when you read this are likely to be lower than those quoted. Check "Late List Prices" for the latest prices we could get before we went to press.

The biggest reason DX2-66 systems are so affordable is that vendors can just drop the chip onto existing 33-MHz 486 system boards; they may have to tweak the BIOS a bit and perhaps improve the case's ventilation, but that's about it.

Price variations among these systems tend to hinge on several key design and configuration factors. The EISA-based systems we looked at, for example, averaged about $800 more than the ISA machines, and systems using SCSI instead of IDE hard drives averaged $900 more. The inclusion of caching controllers helped raise the cost of a system by about $300. Interestingly, machines using local-bus graphics cost just $100 more than those with regular ISA video. The most expensive system in the review, the $4297 Zenith Data Systems, includes an ethernet adapter and a SCSI controller on an EISA bus system.

Service and Support: A Brighter Picture

A fast, cheap system may not be a great value if it lacks good service and support—a major factor in our choice of overall Best Buys.

To rate vendors' customer service and support, we placed anonymous calls to their tech support lines and posed typical questions. We then graded the vendors on responsiveness, courtesy, accuracy, and thoroughness. We also considered the length of the warranty, the cost (if any) of on-site service, and the turnaround time for off-site repairs.

The quality of service and support continues to improve industrywide. On a scale from 0 to 100, almost all these vendors scored over 80. Most offer on-site service and fast turnaround on factory service, and most provide long hours (including weekends) of telephone tech support. Warranties are getting longer, too. A one-year warranty has been standard, but now two-year warranties are be-

Best Performance

All these systems except the Tri-Star come with caching disk controllers. All use ATI, Western Digital, or S3 video processor chips, some in local-bus designs. Since half the systems in the review were within 20 percent of the fastest machine on performance, it isn't surprising that these hot rods won out through the careful use of high-performance components.

1. **Tangent Computer Model 466ex** (page 120)
2. **Lodestar Computers 486LB DX2/66 Winstation** (page 118)
3. **Hertz Computer 486/D66X2e** (page 117)
4. **Axik Computer Ace Cache 486DX2-66** (page 114)
5. **Tri-Star Computer 486/66 DX2 VL-Station** (page 121)

Best Price

The biggest surprises here are three companies you wouldn't have expected to see on a lowest-price list. Hyundai and AST have always had aggressive pricing, but not to this degree, and a few months back DEC would have been one of the most expensive systems in the review.

1. **CAF Technology CAF Gold 6B2** (page 114)
2. **DEC DECpc 466d2 LP** (page 115)
3. **AST Bravo 4/66d** (page 113)
4. **Blackship Computer Systems BLK 486DX2/66** (page 114)
5. **Hyundai Electronics 466D2** (page 118)

Best Service and Support

Hyundai has revamped its PC operations, including its service and support. The other companies in the top five are small ones. The recent price wars have forced small companies—already selling at razor-thin profit margins—to add value, and for some that has meant improving service and support.

1. **Hyundai Electronics 466D2** (page 118)
2. **Blackship Computer Systems BLK 486DX2/66** (page 114)
3. **Lodestar Computers 486LB DX2/66 Winstation** (page 118)
4. **Axik Computer Ace Cache 486DX2-66** (page 114)
5. **PowerBox Systems PBS1 466I** (page 120)

coming more common, and a few vendors even offer three years.

Which Way Is Up?

You may think that DX2-66s don't have to be upgradable because they are already the fastest systems on the market. However, in the near future you should have a choice of a couple of upgrade paths for this CPU. The first will come in the form of a next-generation OverDrive chip for DX2s. This chip is based on Intel's newly announced Pentium technology and is scheduled to ship some time early next year. It will require a 238-pin upgrade socket. Although many systems will include this socket soon, the Acer is the only one of the reviewed systems that has one.

Warranties are getting longer, too. A one-year warranty has been standard, but now two-year warranties are becoming more common, and a few vendors even offer three years.

Second, the systems that use a CPU daughterboard should be able to handle any chip advances (though the upgrade cost will be higher because you're replacing a board instead of just a chip). As new processors emerge, you can buy the appropriate CPU board upgrade from the system vendor and replace the original DX2-66

Acer America AcerPower 486e DX2/66 Model 5657

VITAL STATISTICS

Street price: $2962
PROS: P24T socket and integrated SCSI adapter
CONS: Average performance
Contact: 800/733-2237, 408/432-6221 (fax)
Reader service no. 605

In its DX2-50 incarnation, this system was a Best Buy in our February cross-processor comparison. In that review, we admired its balance of performance, price, expandability, and design. Upgraded with the DX2-66 processor, however, it doesn't fare as well, though it's still a very nice system.

Expandability is one of the Acer's strengths. It has four free EISA slots, plus one proprietary 32-bit local-bus slot and two free 8/16-bit ISA slots. Acer's own ATI-based PowerVision video controller occupies the local-bus slot. Mass storage is handled by a 203MB Conner hard drive. You get one externally accessible 3½-inch drive bay (occupied by a floppy) and three externally accessible 5¼-inch bays, two of which are free for a tape or CD ROM drive (which can be handled by the SCSI-2 adapter integrated on the motherboard). This system also earns points for upgradability, with a multipurpose CPU socket that accepts not only today's 486 CPUs but also Intel's next-generation, Pentium-based upgrade processor, which is expected to arrive early next year.

Beyond expandability, however, the Acer gets mixed reviews. Its $2962 price is reasonable, right in the middle of the spread. The system performed respectably on our *Windows* suite, particularly on the *Freelance* and *Excel* tests. It was less successful on the BAPCo suite, where it placed next to last overall, about 56 percent slower than the system fastest on BAPCo.

Though Acer's service and support is more than adequate, the company lost points because it was slow to respond to our calls and then answered a relatively easy question inaccurately. It also requires up to a week to turn around factory repairs. If you want to be ready for Intel's next-generation OverDrive technology, the Acer looks pretty good; otherwise you're advised to go with one of our Best Buys.

Amax Engineering 486DX2/66 MHz ISAmax System

VITAL STATISTICS

Street price: $2746
PROS: Fairly cheap, caching disk controller
CONS: Below-average Windows performance
Contact: 800/800-6328, 510/651-8886
Reader service no. 606

It takes a lot to stand out in this exceptional field, and, despite some attractive features, the Amax ISAmax can't manage to rise above the crowd.

That's not to say the Amax doesn't have its good points. Its $2746 price is extremely attractive for a system using such a hot processor, but its performance is only average among these systems. It did best on the DOS-intensive BAPCo suite, particularly on the graphics and software development sections. The system had less success on the *Windows* suite—it was 27 percent slower than the leader overall, despite an S3-based NDI Volante Warp10 graphics board.

Storage chores are handled by a 203MB Conner hard drive, which is run by a 512K caching controller. The system gives you eight 8/16-bit ISA slots, but two of them are occupied: one by the graphics controller, the other by the I/O board (which obstructs a third with slot-cover–mounted I/O ports). One bonus: The system comes with a nice 15-inch Mag multiscan monitor.

The case and documentation are strictly generic, and the motherboard could be laid out more neatly (SIMM sockets are buried under a tangle of disk cables). Beyond these small complaints, the biggest problem with this system is that it's unexceptional. In a field this competitive, that doesn't earn it more than a pat on the back.

board. Of the reviewed machines, the Swan, Zenith Data Systems, and DEC use CPU daughterboards.

Naturally, there's more to the design of a system than its upgradability. We look at the number and types of free slots and bays and the availability of alternative interfaces like SCSI or ethernet to rate each system's capacity for expansion. We also scrutinize the quality of the keyboard and monitor and consider such important details as access to essential items on the motherboard. In addition, we consider the system's visual design.

The bottom line is that the value to the customer is getting better all the time. After we evaluated these systems, it became clear that they're among the most attractive machines on the market today, especially in price/performance terms. All but the most price-conscious buyers can afford one of the cheaper systems here, which will still blow away anything but the fastest 486DX-50s. If you want even more speed, look into adding a caching controller or putting more RAM on an existing controller. If you don't want to get left behind again, buy a system with a socket for a next-generation OverDrive or one that uses a CPU daughterboard; but for even the most challenging *Windows* applications, any DX2-66 will keep you cruising for a long time to come.

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AST Bravo 4/66d Model 123B

VITAL STATISTICS

Street price: $2340
PROS: Low price, very good Windows performance
CONS: Only one free drive bay, small hard drive
Contact: 800/876-4278, 714/727-4141
Reader service no. 607

Like the Acer AcerPower, the AST Bravo won a Best Buy in our February systems review, but among its peers it doesn't earn any bragging rights. Nonetheless, the details that made the Bravo a Best Buy last month still earn it some big points.

At just $2340, the AST Bravo is the third cheapest PC here. Yet it more than holds its own when it comes to performance. It came in just 14 percent slower than the fastest system by posting decent times on the *Windows* tests and by scoring well on every section of the BAPCo suite. The result is one of the best price/performance ratios in the review. The AST's speed is due in part to the integrated Cirrus Logic video accelerator chip and the 256K external cache.

All this performance is packed into an attractive compact case that, not surprisingly, sacrifices some expandability. You get only two externally accessible drive bays, both of them occupied by floppies; to add a tape backup or CD ROM drive, you'll have to find an external model. The only free drive bay is inside the case and could be used for a second hard drive to bolster the relatively puny 116MB Quantum disk that comes standard. Thanks to the high degree of integration on the motherboard, all four ISA slots are free.

AST backs this system with a nice service-and-support package that includes a year of free on-site service and toll-free technical support (even on weekends).

We applaud the AST Bravo for its great price and performance. If you can live with limited expandability and want a cheap, fast system, the AST is well worth a closer look.

ATronics Int'l ATI-486/66

VITAL STATISTICS

Direct price: $2995
PROS: Good Windows performance, large 321MB hard drive
CONS: None
Contact: 510/656-8400, 510/656-8560 (fax)
Reader service no. 608

Like the AST Bravo, the ATronics nearly makes the top five for overall value, missing it by only a narrow margin. It does several things especially well.

First, it's fast. This system was just 15 percent slower than the overall speed champ from Tangent. It performed especially well on the *Windows* tests, in which it was just 5 percent behind the leader.

Second, this tower system stands out by giving you tons of room both now and in the future. It comes with a brawny 321MB Maxtor hard drive. The drive pulls out with the turn of a key; it's a snap for a network administrator to swap out defective drives or secure drives overnight in a safe place. You also get a whopping nine drive bays, seven 8/16-bit ISA slots, and one free 8-bit slot.

All but the most price-conscious buyers can afford to buy one of the cheaper systems here, which will still blow away anything but the fastest of the 486DX-50s.

Third, ATronics backs the system with good customer service. The tech support staff answered our questions perfectly and manages a fast three-day turnaround on factory repairs. The only flaw is a $99 charge for a year of on-site service.

The ATronics's $2995 price is right in the middle of the spread. For the money, you also get a nice 15-inch CTX monitor harnessed to a Diamond Stealth VRAM graphics controller. All in all, if you want a fast tower system with plenty of room to expand, the ATronics is, if not a Best Buy, well worth considering.

Axik Ace Cache 486DX2-66

VITAL STATISTICS

Direct price: $2595
PROS: Great performance and customer service, cheap
CONS: None
Contact: 408/735-1234, 408/735-1437 (fax)
Reader service no. 609

Even in an excellent field, one system has to be best, and this is it. Axik climbs to the top by offering great price/performance and customer service.

The Axik turned in excellent benchmark scores. It was one of the few systems to do as well on the *Windows* tests as on the BAPCo suite. This hot performance can be attributed to several factors, including the Promise Technology caching controller (equipped with 1MB of cache) and the ATI Graphics Ultra video accelerator.

The system also offers plenty of room to grow. It gives you a total of eight drive bays, five of them externally accessible. You get eight 8/16-bit ISA slots, four of which are free because one's slot cover holds extra I/O ports. The system also has a proprietary 32-bit local-bus slot, which according to Axik accepts only Axik's Ace Cache Point 32 video board. It's unoccupied and can double as a regular 8/16-bit ISA slot.

As for service, all calls to Axik's tech support were answered quickly, politely, and almost completely accurately. Tech support is also available through a fax-back program. Axik provides a year of free on-site service and two-day turnaround on factory repairs.

You'd expect to pay top dollar for such an accomplished system, but at $2595 the Ace Cache is one of the least expensive systems in the review. You can't go wrong with high performance, good expandability, low price, and excellent customer service in one machine. That winning combination makes this machine the overall Best Buy.

Blackship Computer BLK 486DX2/66

VITAL STATISTICS

Direct price: $2345
PROS: Great price, generally good performance
CONS: Finished last on Word for Windows test
Contact: 800/531-7447, 408/432-1443 (fax)
Reader service no. 610

The DX2-66 from Blackship just barely missed being included in our top five for overall value. Like the other successes in this tough field, the Blackship does well by doing a little bit of everything.

The Blackship's most attractive feature is its extremely reasonable $2345 price—the fourth lowest in the review. That money buys you, among other things, a 202MB Maxtor hard drive, which occupies one of four externally accessible drive bays. Two more bays hold floppies, leaving one available for a tape drive or other storage device. The system also comes with five 8/16-bit ISA slots, one of them occupied by an OEM video controller card using a Cirrus Logic chip set.

You also get good, though erratic, performance. The Blackship turned in wildly different times on separate sections of the *Windows* suite—it was the fastest system on the *Freelance* test but 80 percent slower than the fastest system on *Word for Windows*. Results were equally varied on the BAPCo suite, in which the Blackship did relatively well on the desktop publishing and spreadsheet tests and relatively poorly on the database, graphics, and software development sections.

Blackship's other great strength is service and support. When we called the tech support staff anonymously with our questions, they answered immediately and their responses were right on the money, and the system is backed by a year of free on-site service and a two-day turnaround policy on factory repairs. The result: Even in this fast company, the Blackship is well worth a test drive.

CAF Technology CAF Gold 6B2

VITAL STATISTICS

Street price: $2042
PROS: Lowest price in review
CONS: Strictly generic design
Contact: 800/336-9369, 818/369-3690
Reader service no. 611

In a contest of generally fast machines, price can be the great differentiator. That's what sets the CAF Gold 6B2 apart from every other system here: At just $2042, it's the least expensive system by $200.

A low price won't do you much good without at least competitive performance, which the CAF delivers: It's just 20 to 30 percent slower than the fastest system here. It turned in particularly good times on the *Freelance* test and consistently good times on all sections of the BAPCo suite, with the exception of the graphics test. This weakness may be due to the no-name graphics accelerator card.

The anonymous video card is one example of the CAF's main weakness, which is a generic, one-size-fits-all approach to design. The exterior styling is nice enough—a clean front panel with no unnecessary controls, a good keyboard, and an easy-off case. Inside, however, cables come off the combination I/O-controller board and obstruct two of the expansion slots. On the upside, the system comes with a decent 202MB Maxtor hard drive and a generous eight ISA slots.

The CAF also lost a few points on customer service; the company ranked second to last in a strong field. While CAF's tech support

department answered our calls accurately and quickly, the company provides neither on-site service nor a toll-free tech support line. Company representatives say they encourage, but don't require, dealers to provide on-site service, so the quality of service depends on your local dealer.

At this price, many will put up with a few design flaws and will haggle over service with their dealer. This is a solid, reasonably speedy system at a rock-bottom price—a combination you may find irresistible.

Compaq Deskpro 4/66i Model 120/w

VITAL STATISTICS

Street price: $2626
PROS: Business Audio, excellent Windows performance
CONS: No free drive bays
Contact: 800/345-1518, 713/370-0670
Reader service no. 612

The Compaq Deskpro 4/66i is one of several systems in this review that pack a speedy DX2-66 processor into a compact, low-profile case. It's clearly not meant to be a network server. The case has room for just three drive bays, two of them externally accessible but already filled with the two floppies; the single internal drive bay is filled by a relatively small 116MB Quantum hard disk. You also get just three 8/16-bit ISA slots—though all of them are free—because Compaq has integrated its own QVision video accelerator, as well as the disk connector and I/O, on the motherboard. The motherboard also holds Compaq's Business Audio hardware, which along with the bundled microphone and set of headphones gives you *Windows 3.1* sound capabilities good enough for voice annotations but not for music or other hi-fi applications.

Except for its limited expandability, this system is on a par with any other here. The $2626 price puts it just $180 away from the best five for price, and its performance is more than competitive, especially on *Windows* apps. Thanks in large part to QVision, the Deskpro turned in particularly good scores on the *Excel* and *Paradox* tests. Performance on the BAPCo suite was less impressive.

Compaq revamped its service-and-support package as we went to press. It now features a three-year warranty, weekend support, a year of free on-site service, and toll-free technical support. The one weakness we detected in the customer support is the lack of a turnaround policy for off-site repairs. Company representatives say that there's no such policy because users return their units to dealers first; dealers send the unit back to Compaq only if they can't fix it themselves.

If it weren't for the limited expansion options and the subpar BAPCo numbers, the Deskpro would be one of the most attractive systems here. As it is, if you want a fast system for *Windows* that won't take up much desk space, this machine is a contender.

DEC DECpc 466d2 LP

VITAL STATISTICS

Direct price: $2284
PROS: Great styling, very low price
CONS: Disappointing service and support, average performance
Contact: 800/722-9332, 800/524-5694
Reader service no. 613

There's just something appealing about putting a DX2-66 into a low-profile case—it makes you think of a sports car. The compact DECpc is one of the hottest-looking systems in this review, offering a sleek, uncluttered front panel. What's really remarkable is, at $2284, the DECpc costs just $242 more than the cheapest system in the roundup—a bit like getting Porsche styling and engineering at a Yugo price.

Like the other compact systems here, the DEC offers limited expandability, although the CPU can be upgraded because it sits on a daughterboard. It has just two internal bays, one of them free (a 234MB hard drive sits in the other), and two occupied externally accessible drive bays; if you wanted to add a tape drive, you'd be out of luck. The system has three 8/16-bit ISA slots, all of which are free, thanks to integration of the video and other peripheral controllers on the motherboard.

Performance is good, but not good enough in this crowd. The DEC produced just average numbers on both our *Windows* and BAPCo tests—despite the S3 video accelerator chip integrated onto a local-bus circuit on the motherboard.

Even worse, DEC came in last in our service-and-support evaluations (though it still got very respectable scores since industrywide, service and support is improving so fast). When we called tech support, they made us hold for long periods and answered two of our questions incorrectly. The reason: DEC's mail-order business has become such a success that the company has had a hard time keeping up with the volume of sales and the subsequent phone calls. DEC has scored well for service in previous reviews, so the service picture will likely improve in the near future. DEC offers the two-day turnaround policy on repairs, one year of free on-site service, and toll-free tech support line we praised last month.

What's really remarkable is, at $2284, the DECpc costs just $242 more than the cheapest system in the roundup–a bit like getting Porsche styling and engineering at a Yugo price.

Despite the hot design and low price, the DEC's poor expandability, average performance, and overburdened customer support make it a fair-to-middling value this time around. If you're looking for an inexpensive network node and care more about how a system looks than how many slots it has, this DEC is well worth considering. After all, nobody buys a Porsche for good gas mileage.

Dell Computer 486D/66

VITAL STATISTICS

Direct price: $3218
PROS: Excellent customer service
CONS: Average speed, high price
Contact: 800/289-3355, 800/727-8320
Reader service no. 614

The good news is that the Dell 486D/66 is backed by some of the best customer service in this review—Dell missed inclusion in our service top five by just a fraction of a percentage point. The tech support people answered our sample questions perfectly, and the phone lines are open 18 hours a day.

The bad news is that the Dell's performance is average—it's still a screamer, but not fast enough to attract notice in this company. Perhaps it's the lack of an external RAM cache, but the 486D/66 turned in subpar times on virtually every test, with the exception of the graphics section of the BAPCo suite.

The Dell didn't do much better when it came to price. At $3218, it's slightly expensive among these systems. For the money, you get a relatively small 116MB Quantum hard drive and a 3½/5¼ combo floppy drive (which leaves you with two externally accessible drive bays free). Thanks to the integration of video, disk controller, and I/O functions on the motherboard, the midsize system also has six 8/16-bit slots free.

Nice design and excellent service aren't enough to overcome ordinary performance and a high price. If you want the security of knowing you're buying from one of the most reputable firms in the business, with some of the best customer support available, then this system is worth consideration. However, several faster and less expensive alternatives are available.

At press time Dell indicated it would replace this system with an improved DX2-66. It should be worth taking a look at.

DFI 486-66 DX2

VITAL STATISTICS

Street price: $3767
PROS: Upgradable processor board, reasonably fast
CONS: Expensive
Contact: 916/568-1234
Reader service no. 615

The DFI 486-66 was just 8 percent shy of the top five for overall performance. It turned in a faster time on the *Word for Windows* test than any other machine. It also did quite well on the word processing, spreadsheet, database, and desktop publishing sections of the BAPCo suite.

The fast *Windows* times may result in part from DFI's integration of the Tseng ET4000AX video controller onto the removable CPU card used in the system. Another benefit of this CPU-board design: You'll be able to upgrade when faster processors become available, without worrying about upgrading your BIOS or changing the system clock.

The compact case makes room for four free 8/16-bit and two free 8-bit expansion slots. You get just three externally accessible drive bays (only one of which is free); the single internal drive bay is occupied by a 202MB Western Digital hard drive. Strangely enough, the external RAM cache isn't integrated onto the CPU board, but onto the main board instead.

DFI offers an attractive service-and-support policy, marred only by the lack of a turnaround policy. Responses to our tech support questions were nearly perfect, and the company provides a year of free on-site service. Unfortunately, fast performance and good service can't justify this system's high price. At $3767, it's one of the more expensive here, far above the $3000 average. Despite the good speed, you can find better values elsewhere.

EPS Technologies 486-DX2 66

VITAL STATISTICS

Direct price: $2645
PROS: Good price, sound-capable video board
CONS: Comparatively slow
Contact: 800/447-0921, 605/966-5586
Reader service no. 616

With a street price of just $2645, this system is one of the cheapest in the review, quite a bit below the $3000 average. You get some nice design and expansion features, including a 15-inch monitor and an Orchid Fahrenheit VA video board, the latter offering both accelerated graphics and basic sound capabilities, including I/O ports for microphones, headphones, and speakers. You also get six 8/16-bit ISA expansion slots, four of which are free after you account for the video and I/O boards, and two 8-bit slots. The desktop case has four externally accessible drive bays, two of which are free. A 202MB Maxtor hard drive occupies one of two internal full-size bays.

The low price includes decent customer service. EPS offers a three-year warranty, a year of free on-site service, two-day turnaround on factory repairs, and 12 hours of tech support per day. The only fault we found with tech support was a minor inaccuracy in their response to one of our questions; their answers were fine otherwise.

Sad to say, despite the Orchid accelerator and a 256K external cache, the EPS's performance didn't live up to its respectable specs. It produced consistently subpar times on both the *Windows* tests and the BAPCo suite. If you want the best combination of price and performance, several other systems will fit your needs better.

First Computer Systems FCS 486-66

VITAL STATISTICS

Direct price: $3299
PROS: Caching disk controller with 2MB, tower system with lots of slots and bays
CONS: Ordinary performance
Contact: 800/325-1911, 404/441-1911
Reader service no. 617

Like certain fast-food restaurants, First Computer Systems will build pretty much any kind of system to order. FCS built us a decent, if generic, 486DX2-66 machine.

The tower case is identical to that used by PowerBox. Inside, there's a 203MB Western Digital hard drive attached to an impressive 2MB Ultrastor 15c caching controller, which helped the system blaze through some disk-intensive tests, particularly the BAPCo software development benchmark. In other tests, however, the FCS was less impressive, achieving only midpack performance overall. The unremarkable speed may result in part from the system's Orchid Fahrenheit 1280 video accelerator. Once considered a fast board, this video veteran has been eclipsed by local-bus designs and second-generation *Windows* accelerators.

In fact, "middle of the pack" pretty much sums up the FCS, from speed to service and support. Expandability is the one bright spot, thanks to a total of eight drive bays, only three of which are used by the floppy and hard drives. There are also five free slots.

First Computer Systems' flexibility makes the company worth considering if you need a custom configuration. If you're looking for top speed or a bargain price, however, check out some of the better buys in this review.

Gateway 2000 4DX2-66V

VITAL STATISTICS

Direct price: $2875
PROS: Fast, good all-around quality
CONS: None
Contact: 605/232-2000, 605/232-2023 (fax)
Reader service no. 618

The Gateway is not only a jack-of-all-trades, it's a master of them, too. Let's start with speed. It ran only 6 percent slower than the fastest system—almost indistinguishable from the fifth-place finisher—and earned the best overall *Windows* benchmark scores. Good integration, an ATI local-bus graphics accelerator, and a local-bus IDE hard drive controller all contribute to this bravura performance.

This speediest of *Windows* performers is also better than average in price, only about $950 more than the cheapest system we tested. You also get one of several major apps for free. Gateway's service and support is quite good: free on-site service for a year and accurate answers to our test questions (although we had to wait a while to get them).

Integration is the key here. Since most system functions are either on the motherboard or controlled through the two VESA local-bus slots, the system has six 8/16-bit ISA slots free. It also comes with a high-quality Gateway CrystalScan 15-inch flat-screen monitor. The speedy local-bus hard drive is a 202MB unit, but Gateway offers a 340MB unit as standard for only $120 more. Every detail of the design is carefully thought out. Tight integration around really fast components accounts for the superb performance at a reasonable price.

All-around excellence makes this Gateway the decathlete of DX2-66 computers. We recommend it wholeheartedly, particularly as a powerful *Windows* workstation.

Hertz Computer 486/D66X2e

VITAL STATISTICS

Direct price: $2895
PROS: Fast, 4MB caching disk controller, integrated SCSI and ethernet
CONS: Only two free drive bays
Contact: 800/232-8737, 212/684-3658 (fax)
Reader service no. 620

Remember those Hertz Rent A Car ads showing O. J. Simpson running through an airport? Hertz the computer company (no relation) seems to have the same idea. Its 486/D66X2e system is one of the fastest machines in this review. It was close to the front of the pack on several segments of the *Windows* test suite, and it did even better on the BAPCo suite, with a first-place finish on the spreadsheet section and impressive numbers on everything else but the database tests.

The Hertz's performance scores are undoubtedly helped by the heavy-duty Ultrastor 15c IDE controller with 4MB of disk cache. While it isn't a local-bus solution, the ISA-based Diamond SpeedStar video accelerator board seems to have helped as well. The system's compact desktop case also holds a total of five drive bays, but two floppy drives and a single hard drive take up three of them. Service and support is ordinary. Although Hertz answered all our questions promptly and correctly, it charges for on-site service, and its support hours are shorter than most. It should be pointed out that the company has specialized in selling to large enterprises that have dedicated in-house support staffs.

Surprisingly, all this speed and expandability is available for an extremely reasonable $2895—slightly less than the average for this review. Like the Gateway system, the Hertz is a great all-around system with a low cost, acceptable service and support, and good design. The result is a third-place spot on our Best Buy list.

Hyundai Electronics 466D2

VITAL STATISTICS

Direct price: $2448
PROS: Cheap system with fast VESA local-bus video controller
CONS: Slow for a DX2-66
Contact: 800/933-3445, 800/283-4986
Reader service no. 621

Hyundai is making a big new push into the PC marketplace. This system is one of the company's first shots at the competition.

One of Hyundai's hottest selling points is its new centralized customer service, and it seems like a winner. The tech support people answered our questions promptly, politely, and almost perfectly. Service is available seven days a week, 24 hours a day, and includes a special help line for beginners. As a result, Hyundai waltzed away with our top honors for service and support. Another sign of Hyundai's aggressive strategy is the price of the 466D2—at $2448, it's just $400 more expensive than the cheapest system here.

Unfortunately, we weren't able to get a 486DX2 system from Hyundai configured exactly as we wanted it by press time. The system we looked at came with a 116MB Conner hard drive; shipping systems will include a 300MB hard drive that should be noticeably faster than the one we tested. With the current drive, the Hyundai fared poorly, finishing well below average on the *Windows* tests and even further back on the BAPCo suite. This seems odd since the Hyundai system uses a fast VESA local-bus video controller, the ATI Graphics Ultra Pro. We suspect that not all the bugs had been worked out of the video driver and that a simple driver and hard disk upgrade could improve this PC's performance dramatically.

If you're looking for a reliable PC with a good price and lots of hand-holding, then this Hyundai could be for you.

Lodestar 486LB DX2/66 Winstation

VITAL STATISTICS

Direct price: $3329
PROS: Quick, great service, caching disk controller
CONS: Uses proprietary local bus, pricey
Contact: 800/875-7568, 818/810-5928 (fax)
Reader service no. 622

This speedy system won second-place performance honors for a superb set of results on the BAPCo test suite, where it got top scores in every category and was just 7 percent slower than the fastest system here. Although it did slightly less well on the *Windows* test suite, it still finished just 5 percent behind the leader.

What's the source of all this speed? A SuperIDE caching controller with 2MB of RAM and a proprietary local-bus card for fast video. The local-bus implementation in this system is rather odd and looks like two back-to-back ISA slots. The 486LB DX2/66 Winstation has two of these slots, one occupied by the video board and the other free. Unfortunately, since the slot is proprietary, you won't be able to stick in one of the many VESA drive controller or networking cards that are beginning to appear. Instead, you'll have to wait until Lodestar issues other proprietary cards.

In addition to its speed, there's a lot to like about the Lodestar. Its tower chassis has eight drive bays, three of which hold the two floppies and the 203MB Western Digital hard drive. Lodestar helps out your eyes by throwing in a flat-screen 15-inch monitor. And the support staff answered our questions perfectly.

At $3329, the Lodestar isn't cheap, but you get a lot of machine for your money, along with solid service and support and a two-year warranty. If money isn't your primary concern, this machine could be what you're looking for.

NEC PowerMate Express 486DX2/66e

VITAL STATISTICS

Street price: $4102
PROS: Huge hard drive, upgradable processor board design, great monitor
CONS: High price
Contact: 508/264-8000, 800/388-8888
Reader service no. 623

For a compact system, the NEC PowerMate Express 486DX2/66e is incredibly expandable. It includes a caching SCSI controller (with 512K of cache expandable to 16MB), which powers a mammoth 509MB Maxtor hard drive. It also has four free EISA slots. There are also four free drive bays, and the SCSI port will let you tack on additional peripherals like a tape backup or a CD ROM drive with ease. As usual with NEC systems, the monitor is one of NEC's own standard-setting MultiSyncs, in this case the 3FGx. Graphics are controlled by NEC's Image Video system, which consists of an NEC proprietary local-bus board based on a Tseng ET4000 chip. The system includes circuitry to detect the presence of high-frequency MultiSync monitors and automatically improves the refresh rate if the monitor can handle it. The result: the best picture the board and monitor can produce every time.

Performance, however, isn't spectacular. Some individual test scores were excellent, including those for databases (thanks to the caching SCSI controller), but overall performance was middling. Fortunately, since the processor is on a daughterboard, you'll be able to upgrade to any future CPU that NEC chooses to supply.

If you want one of the highest-quality monitors available, EISA, and plenty of room for the future, consider the NEC. Just remember that it isn't as good as our Best Buys for price/performance.

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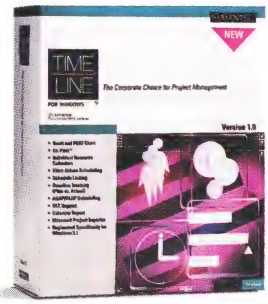

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PowerBox Systems PBS1 466I

VITAL STATISTICS

Direct price: $2899
PROS: Excellent service and support, caching disk controller
CONS: Poor documentation, average Windows performance
Contact: 818/999-9653, 818/999-9683 (fax)
Reader service no. 624

With a name like PowerBox, you'd expect a screamer of a system. This sleek tower certainly looks the part, with its classy matte-black finish, but it doesn't deliver consistently. The system, helped by its caching disk controller, did very well on the BAPCo test suite, especially on the database tests. Unfortunately, it did quite poorly on the *Windows* tests. Perhaps its ISA-based video accelerator card can't compete with some of the faster video systems here. Overall performance placed it in the middle of the pack.

Service and support for the PowerBox was very good: We got accurate answers, short response time when we called the support line, and a two-year warranty. The tower chassis has a total of eight drive bays, five of which are free.

If you must have a PC that matches your black leather office furniture, then by all means go with the PowerBox. But less design- or database-conscious buyers should check out our Best Buys instead.

Swan Technologies 486DX-66DB

VITAL STATISTICS

Direct price: $3305
PROS: Upgradable processor board system
CONS: Average performance
Contact: 800/468-9044, 814/237-4450 (fax)
Reader service no. 626

This Swan's nicest feature is, its wings won't get clipped as new processors appear and desktop PCs get faster and faster. The CPU, along with the proprietary integrated local-bus video, resides on a removable daughterboard. When Intel brings out its Pentium-based OverDrive chip, Swan should supply a board that can plug into your system.

Until that future arrives, however, the Swan 486DX-66DB is at best a plain cygnet, if not an ugly duckling. Performance was average both in the BAPCo suite and the *Windows* tests. From price to service and support, the Swan fell roughly in the middle of the reviewed systems. A slightly cramped case that has only four drive bays doesn't leave much room for the Swan to spread its wings, but a space-saving combo floppy drive helps a bit. If you want to make sure you can keep up with changing technology, consider the Swan, but only as one of several upgradable systems.

Quill Computer Qtech 486DX/2 66ET

VITAL STATISTICS

Direct price: $4150
PROS: Highly expandable EISA system, large 324MB hard drive with 4MB caching controller
CONS: High price, average performance
Contact: 708/634-6650, 708/634-6766 (fax)
Reader service no. 625

This attractive entry from Quill fairly bristles with features. Its tower chassis comes with a stunning eight 32-bit EISA slots, five of which are free. One holds a SCSI caching controller that's laden with 4MB of RAM and manages a giant 324MB hard drive. Another slot holds an STB WinD/X video accelerator card (which unfortunately has only a 16-bit ISA interface even though it sits in a 32-bit slot). There are seven drive bays, five of which are free, thanks to a combo floppy drive.

Apart from a strong showing on disk-intensive tests, the Quill lagged in performance, finishing 30 percent slower than the fastest system.

If you're looking for a file server, the Quill's big expansion capacity is a plus, as is its high-performance SCSI controller. This system is relatively expensive, but you get a lot of extras for the money.

Tangent Computer Model 466ex

VITAL STATISTICS

Direct price: $3345
PROS: Fast, caching SCSI disk controller
CONS: Fairly expensive
Contact: 800/800-6060, 415/342-9380 (fax)
Reader service no. 627

This hot-rod system produced some of the best performance figures in the review, thanks to great numbers on the BAPCo test suite. Most likely, the Tangent you purchase will perform even better than the one we tested: Tangent is installing EISA-based video controllers in future systems.

The machine's impressive performance on disk-intensive tests isn't surprising given the Adaptec caching SCSI controller with 4MB of RAM. This system includes three free drive bays, one open EISA slot, and four free ISA slots. A 15-inch flat-screen Taxan monitor completes the package. Service and support is ordinary, and tech support failed the toughest of our test questions. If you want speed, consider this Best Buy. Its numbers on our tests are too good to ignore.

Tri-Star 486/66 DX2 VL-Station

VITAL STATISTICS

Direct price: $3695
PROS: Fast, nice 17-inch monitor, VESA local-bus video
CONS: Pricey
Contact: 800/800-7668, 602/961-3401
Reader service no. 628

The Tri-Star delivers stellar performance, finishing just a fraction of a percent behind the leader on the *Windows* suite and almost as strongly on the BAPCo tests. Although the 202MB hard drive is controlled by a standard IDE controller, Tri-Star includes a local-bus SCSI-2 adapter. The company also plans to migrate its motherboard designs to EISA bus designs soon.

A local-bus ATI card, similar to the one used in several of these PCs, provided graphics in our test system. Impressively, Tri-Star has chosen to match this video board with a superb Hitachi 17-inch flat-screen monitor that meets all the tough Swedish MPR-II radiation standards. A two-year warranty is part of a good service-and-support package.

This tower system also has five free drive bays out of eight and seven free ISA slots—room enough for plenty of growth. But this performance and technology come at a price—$3695 to be exact. If you want speed, top-notch graphics, and SCSI capabilities in an expandable tower, take a look at the Tri-Star; if the price is beyond you, turn to one of our cheaper Best Buys.

Zenith Data Systems Z-Station 466XEh

VITAL STATISTICS

Street price: $4297
PROS: SCSI, built-in ethernet, EISA bus
CONS: Pricey, average performance
Contact: 800/553-0331, 800/582-8194 (fax)
Reader service no. 629

This beautifully designed system is extremely modular. Intended as a network node workstation, it has only two free drive bays and four free EISA slots, but you can upgrade using a daughterboard.

Our unit came with an ethernet-compatible, Novell-certified LAN module and a SCSI-2 module in place. In addition, ZDS supplies *Windows for Workgroups* free, along with the client shells for Novell NetWare, *Microsoft LAN Manager,* and Banyan's VINES. The added value could be well over $1000 to some purchasers of network workstations.

This system lacks a caching disk controller and uses an ISA-based ATI graphics accelerator. Nevertheless, it did better than average on the *Paradox* and BAPCo database tests, helping it to a middle-of-the-pack finish overall, 20 percent slower than the fastest system.

Some of ZDS's dealers are authorized service centers and can give superb service. While the company's phone support hours are long, tech support gave us confusing answers when we called.

The ZDS costs too much for a Best Buy, but given its features, consider it if you need a high-performance network workstation.

For more information about all products in this article, circle reader service no. 900.

(continues on page 127)

Late List Prices

Industrywide, prices appear to be stabilizing after last year's free-fall, but prices for some systems in this review changed dramatically between November and January. Among the most notable: The cost of the already affordable machine from Blackship dropped 15 percent, from $2345 to $1995, enough to make it the cheapest system here. Still, our top five price champions would remain the same—they'd just switch places.

Blackship Takes the Lead for Price

	List price as of January 1993[1]	Price drop from November 1992
Acer America AcerPower 486e DX2/66 Model 5657	$3569	none
Amax Engineering 486DX2/66 MHz ISAmax System	$2985	none
AST Bravo 4/66d Model 123B	$3055	$150
ATronics Int'l ATI-486/66	$2995	none
Axik Computer Ace Cache 486DX2-66	$2595	none
Blackship Computer Systems BLK 486DX2/66	$1995	$350
CAF Technology CAF Gold 6B2	$2459	none
Compaq Computer Deskpro 4/66i Model 120/w	$3364	$47
DEC DECpc 466d2 LP	$2284	none
Dell Computer 486D/66	$3219	none
DFI 486-66 DX2	$4005	$534
EPS Technologies 486-DX2 66	$2545	$100
First Computer Systems FCS 486-66	$2999	$300
Gateway 2000 4DX2-66V	$2875	none
Hertz Computer 486/D66X2e	$2660	$235
Hyundai Electronics 466D2	$2448	none
Lodestar Computers 486LB DX2/66 Winstation	$3299	$30
NEC PowerMate Express 486DX2/66e	$5398	none
PowerBox Systems PBS1 466I	$2899	none
Quill Computer Products Qtech 486DX/2 66ET	$3950	$200
Swan Technologies 486DX-66DB	$2899	$406
Tangent Computer Model 466ex	$3295	$50
Tri-Star Computer 486/66 DX2 VL-Station	$3695	none
Zenith Data Systems Z-Station 466XEh	$3799	$498

[1] All prices for configurations specified in Features Comparison.

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9724 ☐Alpha FOUR 2.1 Competitive Upgrade ..... $89.
Approach Software
3830 ▣Approach for Windows Competitive Upgrade .. 95.
Borland International
3684 ☐Quattro Pro 1.0 Windows Competitive Upgrd. 89.
Claris Corp.
5228 ▣FileMaker Pro Competitive Upgrade ..... 89.
Corel Systems
4560 ☐CorelDRAW! 3.0 Competitive Upgrade ..... 179.
Gold Disk
5412 ☐Gold Disk Professional Draw Comp. Upgrd. . 115.
Microsoft
5693 ☐Excel 4.0 Competitive Upgrade ..... 125.
8353 ☐PowerPoint 3.0 Competitive Upgrade ..... 125.
3881 ☐Word for Windows 2.0A Competitive Upgrade 125.

SOFTWARE

AddStor
8807 ▣SuperStor Pro 1.0 ..... 85.
Adobe Systems
7547 ▣Adobe Type Manager 2.5 for Windows ..... 59.
6591 ☐Adobe Illustrator 4.0 for Windows ..... 389.
7940 ☐Adobe Type Set Value Pack *(30 fonts)* ..... 39.
(Entire Adobe Type Library available.)
AGFA
10396 ▣Discovery TrueType Pack ..... 49.
Aldus
1332 ☐PageMaker 5.0 for Windows ..... 589.
Alpha Software
5104 ▣Alpha FOUR 2.0 *(incl. Free 2 LAN Pack)*..... 329.
Altsys Corporation
8675 Fontographer for Windows *(3½" only)*..... 259.
Application Techniques
8337 ▣WinDings 1.0 for Windows ..... 49.
1214 ▣Pizazz Plus 3.0 ..... 79.
Approach Software
6598 ▣Approach 2.0 for Windows ..... 259.
Ares Software
6030 ▣FontMonger 1.06 for Windows ..... 89.
Artisoft
2455 Lantastic AE-2 EtherNet Starter Kit 4.1..... 469.
9775 Lantastic AE-2 Starter Kit for Windows ..... 499.
2452 AE-2 EtherNet Adapter Card..... 199.
Atech Software
4797 ▣AllType 2.0 *(universal typeface converter)*..... 45.
10078 ▣Variety Font Pack 1.0 ..... 49.
Automap
2729 ▣Automap USA for DOS.. 55. 8569 Windows . 55.
Avery Dennison
6006 ▣Label Pro 1.6 *(Laser)*..... 49.
Banner Blue Software
2088 ▣Org Plus 1.0 for Windows..... 125.
Berkeley Systems
9885 ▣After Dark 2.0 for Windows ..... 29.
6649 Star Trek: The Screen Saver *(3½" only)*..... 34.

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9548 *ProLinea 3/25s with 84 MB*..... **939.**
9553 *LTE Lite/25c with 120 MB* ..... **3589.**
9550 *Contura 3/25c with 84 MB* ..... **2349.**
9551 *Contura 3/25c with 120 MB* ..... **2629.**

Bitstream
8040 ▣FaceLift 2.0 for WordPerfect 5.0/5.1 ..... 69.
2089 ▣MakeUp 1.1 for Windows 3.0/3.1 ..... 79.
Borland International
9635 ☐Object Vision 2.1 ..... 99.
10616 Quattro Pro for Windows *(3½" only)*..... 95.
1514 ☐Paradox 4.0 ..... 529.
Broderbund
5900 ▣PC USA 2.0..... 29. 5902 ▣PC Globe 5.0.... 39.
8855 ☐Print Shop Deluxe 1.0 ..... 45.
Caere
4130 ▣Faxmaster 1.0 ..... 95.
8933 ▣Omnipage Professional 2.1 ..... 629.
Central Point
8114 ▣Backup 7.1.... 89. 5039 ☐PC Tools 8.0.... 125.
ChipSoft
1663 ▣Turbo Tax Personal 1040 for DOS..... 49.
3517 ▣Turbo Tax Personal 1040 for Windows ..... 49.
6221 ▣Turbo Tax/Quicken Bundle 10.1/6.0 Final ..... 59.
3080 ▣Turbo Tax Windows/Quicken Bundle 10.1/2.0 59.
▣Turbo Tax State Packages for DOS..... *ea.* 39.
5366 ▣Turbo Tax DOS/Tax Tutor + 1992..... 79.
Claris Corp.
5257 ▣FileMaker Pro 2.0 for Windows ..... 268.
CompuServe
7546 ▣DOS Membership Kit 2.0..... 25.
Concentric Data Systems
6575 ▣R& R Report Writer DOS 159. 9236 Windows 159.
Contact Software
1625 ▣Act! 2.1 ..... 239.
Corel Systems
5506 ☐CorelDRAW! 3.0 ..... 395.
Data Storm
4798 ▣PROCOMM PLUS 2.01.. 69. 6918 Windows . 99.
DCA/Crosstalk
5611 ▣Crosstalk 2.0 for Windows..... 119.
Delrina Technology
2446 ▣WinFaxPro 3.0.. 79. 5974 ▣DOSFax PRO .. 49.
10454 ▣Windows Communications PAK..... 145.
DeltaPoint
5172 ▣FreezeFrame 1.0 for Windows ..... 62.
8750 ☐DeltaGraph Professional 1.0 for Windows .... 339.
ExperVision
7494 ▣TypeReader 2.0 Windows ..... 499.
Fifth Generation Systems
7725 ▣Direct Access 5.1 ..... 64.
3950 ▣Fastback Plus.... 119. 6431 ▣ Windows .... 119.
Fractal Design
7822 ▣Sketcher 1.0 for Windows ..... 94.
Gibson Research
9832 ▣SpinRite II 2.0..... 59.
Hewlett-Packard
8731 ▣Dashboard 1.0 for Windows ..... 45.
IBM
7303 ☐OS/2 2.0 Upgrade from DOS ..... 99.
Inset Systems
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Intuit
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Lotus
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5653 ☐1-2-3 2.4..... 335. 1852 ☐Upgrade ..... 99.
2755 ☐1-2-3 1.1 for Windows. 309. 3424 ☐Upgrd. 99.

5799 ▣Ami Pro 3.0 239. 1847 Competitive Upgrade 99.
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5981 ☐SmartSuite..... 469.
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4603 ▣TaxCut 1992..... 37.
3885 ▣TaxCut 1992 for Windows ..... 37.
▣State Tax Packages ..... *ea.* 32.
Microcom
6234 ▣CarbonCopy Plus 6.1.. 129. 6958 Upgrade 45.
4410 ▣CarbonCopy Plus 1.0 for Windows ..... 129.
Micrografx
3627 ☐Windows Draw! 3.0 ..... 99.
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2898 Mouse with Windows 3.0 *(bus or serial)* ... 149.
1896 Ballpoint Mouse *(serial only)* ... 119.

MicroSpeed ... 1 year
6007 PC-TRAC Trackball *serial* ... 75.

Microtek ... 1 year
5187 ScanMaker II 879. 5175 ScanMaker IIXE 1099.

Mouse Systems ... lifetime
3213 PC Trackball II *(serial)* ... 55.
7878 PC Mouse III *(serial)*.. 69. 5427 NewMouse .. 62.

Mustek ... 1 year
8454 Matador 105 for DOS ... 95.
7778 PrinScan105... 179. 7780 Color Artist Pro ... 399.
8455 6000C Color Scanner for Windows ... 999.

NEC ... 2 years
4252 MultiSync 3FGX Monitor *(14")* ... 689.
4249 4FG Monitor *(15")*.... 799. 3151 5FG *(17")*... 1449.

Okidata ... 1 year
We are an autorized Okidata Service Center.
5093 OL400 Page Printer *(4 ppm)* ... 649.
9590 OL810 Page... 1089. 5094 OL830 Page... 1299.
3025 Toner Cartridge ... 25.

Orchid Technologies ... 4 years
9417 Fahrenheit 1280 VA with 1 MB ... 229.
4071 Fahrenheit 1280i with 1 MB ... 229.

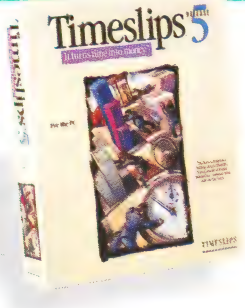
Pacific Data ... lifetime/60 day MBG
Memory upgrade for LJ IIP, III, IIID, IIIP:
7055 2 MB..... 119. 7759 4 MB ... 199.
7959 4 MB Upgrade for LaseJet 4 ... 165.
5729 ProTracer *(personal CAD printer) (1 yr.)*..... 1099.

PC Power & Cooling ... 2 years
9537 CPU Cooler *(for 386/33 up to 486)* ... 29.
3203 Turbo Cool 200 149. 7915 Turbo Cool 300 159.

Practical Peripherals ... lifetime
8993 PM2400 V.42bis *(int.)* 115. 8994 *(external)* 125.
8132 PM2400 Pocket Modem ... 109.
5437 PM2400F Pocket Modem ... 115.
5429 PM2400EFX SAV.42 bis *(external)* ... 145.
5428 PM2400EFX V.42 bis *(internal)* ... 139.
5436 PM2400F SA Mini *(external)* ... 79.
7934 PM9600SA Modem ... 289.
1344 PM2400FX96SA *(external modem/fax)* ... 99.
3803 PM14400FX *(internal modem/fax)* ... 359.
9234 PM14400FXPPM Fax/Modem ... 359.
2425 PM14400FXSA *(external modem/fax)* ... 399.

Targus ... lifetime
1305 Universal Notebook *(computer case)* ... 69.

Technology Concepts ... 2 years
6315 Fax Line Manager 203 ... 125.



TIMESLIPS
5698 ▣ *Timeslips Release 5*—See where your hours are going with Timeslips Release 5. Re-engineered for today's business & service professionals. New features including multiple billing rates & many new reports .... **$189.**

TheComplete PC ... 2 years
6069 TheComplete Modem Plus ... $95.
8593 TheComplete Communicator Gold ... 389.

Tripp Lite ... 2 years
6199 Isobar 4-6 *(4 outlets, Gold Seal Warranty)* ... 49.
6200 Isobar 6-6 *(6 outlets, Gold Seal Warranty)* ... 59.
6797 OMNI 600 LAN Power Backup ... 369.
9312 BC500 Power Backup ... 219.

Video Seven ... 7 years
7362 WIN.VGA 1 MB *(1024 x 768,256 color)* ... 129.
9261 WIN.PRO 1 MB *(1024 x 768,256 color)* ... 175.

Zoom Telephonics ... 7 years
1166 AMX 2400 Baud External Modem ... 63.
1307 Int. 2400 Baud w/9600 Baud Fax Modem ... 79.
1178 Ext. 2400 Baud w/9600 Baud Fax Modem ... 92.
1494 Ext. 9600V.32..... 195. 3075 Internal ... 195.
3574 Ext. 2400 Baud V.42/9600 Baud Fax ... 115.
3386 FaxModem AFC *(2400 baud 96S/48R)* ... 59.
4430 FaxModem AFX *(2400 baud 96S/48R)* ... 79.
4429 FaxModem VFP V.32bis 14,400 baud *(internal)* 219.
4428 FaxModem VFX V.32bis 14,400 baud *(external)* 259.
7921 Pocket FaxModem ... 87.

DRIVES

Colorado Memory Systems ... 1 year
4194 Jumbo 120 Tape Backup ... 199.
4354 Jumbo 250 Tape Backup ... 269.
1213 Trakker 120 Tape Backup *(parallel)* ... 359.
1073 Trakker 250 Tape Backup *(parallel)* ... 429.

Conner Peripherals ... 1 year
2339 CP30104H 120 MB IDE HD *(19 ms)* ... 299.
1337 CP3204 200 MB IDE HD *(16 ms)* ... 429.

Logitech ... limited lifetime/MECA
3295 *Mouseman (combo)*—3 button ergonomic mouse ... **$69.**
3885 ▣ *TaxCut 1992 for Windows*—Guaranteed accurate tax preparation.... **37.**
10573 *Mouseman with TaxCut Windows* **99.**

IOMEGA ... 1 year
6499 Transportable 90 PRO ... 659.
10452 Transportable Multidisk 150 ... 849.
6343 PC Powered 90 *(incl. PC2B & cartridge)* ... 499.
6344 PC Powered 90 PRO *(incl. PC2B, cartridge & Central Point Software)* ... 599.
10537 PC Powered 150 ... 799.
10457 Dual Multidisk 150 ... 1699.
2500 PC2B-2 Controller ... 149.
2530 90 MB Cartridge..... 149. 2467 Tripak ... 439.
8480 Tape250 Insider Tape Backup ... 239.
8481 Tape250 Inside Half-Height Tape Backup ... 259.
8482 Tape250 PC Powered Tape Backup ... 359.
10103 21 MB Floptical Drive *(internal)* ... 459.
10104 21 MB Floptical Drive *(PC Powered)* ... 499.

NEC ... 2 years
6582 CDR74 Portable CD-ROM Drive ... 629.
6581 CDR84 Internal CD-ROM *(reqs. interface)* ... 569.

Pacific Rim ... 1 year
1304 1.2 MB External *(for any parallel port)* ... 239.
2761 1.44EX MB Ext. *(for any parallel port)* ... 239.

Peripheral Land, Inc. ... 1 year
8735 Infinity Floptical Drive ... 399.
8736 Infinity 88 MB Removable *(Syquest)* ... 699.

Quantum ... 2 years
8287 Plus Hardcard II XL 105 MB *(9 ms)* ... 325.
4735 Hardcard E7 127 MB IDE *(17 ms)* ... 329.
4714 Hardcard E7 240 MB IDE *(16 ms)* ... 549.

TEAC ... 1 year
6951 1.2 MB Drive for AT ... 65.
4670 1.44 MB Drive for PC/XT *(3½")* ... 59.
4326 1.44 MB Drive for AT *(3½", with Bastech)* ... 75.
4414 3½"/5¼" Dual Floppy Drive ... 145.

Compaq Computer ... 3 years
9552 *Contura 3/25 with 120 MB*—25 MHz 386SL notebook weighing in at just over 6 lbs. This high powered system includes 4 MB RAM, 64K cache, built-in trackball, 120 MB IDE hard drive, & 640 x 480 display **$2059.**

MEMORY

6556 256k DRAMs *(100 nanosecond, set of 9)* ... call
5510 1 MB x 9 SIMMs *(80 nanosecond)* ... call
2497 4 MB x 9 SIMMs *(80 nanosecond)* ... call
5746 1 MB Chips *(80 ns, set of 9)* ... call

DISKS/MEDIA

Fuji ... lifetime
2214 3½" DS Disks*(10)*..... 9. 2242 *(50)*..... 32.
2215 3½" HD Disks*(10)*..... 15. 2241 *(50)*..... 59.
4863 3½" HD Disks *(20)* w/storage case ... 26.

Sony ... lifetime
3292 5¼" HD Disks*(Qty. 10)* ... 11.
3297 3½" DS Disks *(10)*..... 9. 6148 *(30)*..... 25.
3298 3½" HD Disks *(10)*.... 15. 6375 *(30)*..... 42.
8185 QD2040..... 14. 1895 QD2120 ..... 19.

3M ... lifetime
3943 DC2000..... 17. 1581 DC2120 ..... 22.

Toshiba ... lifetime
4858 3½" 2.88 MB ED Disks *(Qty. 5)* ... 17.
9755 3½" 2.88 MB ED Disks *(Qty. 10)* ... 29.

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Norton-Lambert
2753 ☐Close-Up Dual Pack for Windows & DOS .... $129.
Panacea
2413 ▣WinSpeed 1.0 *(Windows accelerator)* ..... 55.
PC-Kwik
4924 ☐Super PC-Kwik 5.01 ..... 49.
4925 ☐PC-Kwik Power Pak 3.0 w/Power Disk ..... 79.
Peachtree
5757 ▣Accounting 5.0 for Windows ..... 79.
Personics
9288 Laptop Ultravision 2.1 *(3½" only)* ..... 59.
7048 ▣Monarch 2.0 ..... 319.
Polaris Software
4395 ▣PackRat 4.1 ..... 249.
Qualitas
7539 ▣386MAX 6.02 ..... 59.
Quarterdeck
3221 ☐Expanded Memory Manager 386 6.0 ..... 59.
4586 ☐DESQview 386 2.4 ..... 129.
Reality Technologies
6572 ▣WealthBuilder 3.0 *(incl. Smart Investor)* ..... 95.
Reference Software
4396 ▣Grammatik V.... 55. 7483 ▣for Windows... 55.
Shapeware
5426 Visio 1.0 for Windows *(3½" only)* ..... 199.
Sitka
5450 ▣10NET Starter Pack 5.0.1 *(two nodes)* ..... 129.
Sofnet
5883 FaxWorks 2.5 *(Windows & DOS) (3½" only)* ..... 45.
Software Marketing Corporation
5147 ▣Orbits 1.0..... 36. 5145 ▣Bodyworks 1.0 ... 45.
Software Publishing
3482 ☐Harvard Graphics 399. 4403 ☐for Windows 369.
Stac Electronics
1409 ▣Stacker 3.0 ..... 95.
Symantec
3784 ☐The Norton Backup 2.0 for Windows ..... 99.
3146 ☐The Norton Utilities 6.01 ..... 115.
2359 ☐The Norton Desktop 2.0 for Windows ..... 115.
8378 ☐Norton PC Anywhere 4.5 ..... 119.
TIMESLIPS
5698 ▣Timeslips Release 5 ..... 189.
Touchstone Software
7420 ▣Check It Plus 3.0 ..... 85.
Traveling Software
4407 ▣LapLink Pro 4.0 ..... 99.
WordPerfect Corporation
3804 ☐WordPerfect... 269. 3494 ☐for Windows.... 279.
XTree
8328 ☐XTree 1.0 for Windows 65. 6161 ▣Gold 2.5 95.

RECREATIONAL/EDUCATIONAL

Broderbund ... CP
3340 ▣Kid Pix 1.0.. 35. 5851 ▣SimCity from Maxis 29.
4411 ▣SimEarth 1.0 for Windows from Maxis ..... 45.
Interplay
8653 ▣Mario Teaches Typing ..... 24.
4692 ▣Dvorak on Typing for Windows ..... 29.

Inset Systems
3820 ▣*HiJaak 1.0 for Windows*—Enhances & prints graphics images. Converts 23 raster, 15 vector, & 24 fax card formats. Captures graphics screens from Windows & graphics & text screens from DOS applications **$135.**

Microsoft
8492 ☐Golf for Windows ..... $45.
Software Toolworks
4534 ▣Mavis Beacon Teaches Typing 2.0 *(CP)* ..... 29.
5032 Miracle Piano Teacher *(includes keyboard)* ..... 325.
Walt Disney Computer Software
10100 ☐Aladdin Print Kit 1.0 ..... 15.
9984 ▣The Animation Studio 1.0 ..... 72.

HARDWARE

Warranties listed next to manufacturer.

3 Com ... lifetime (conditional)
3453 EtherLink II/16..... 159. 3469 II/16 TP ..... 169.
American Power ... 2 years
7108 Smart UPS 400.... 339. 7105 Smart 600.... 439.
3819 Back-UPS 250..... 115. 3858 Back 400..... 179.
7107 Back-UPS 450..... 215. 3823 Back 600..... 295.
Appoint ... limited lifetime
2469 Thumbelina PC or 2480 MousePen Pro PC *ea.* 59.
9564 Gulliver ..... 59.
ATI Technologies ... 5 years
8463 VGA Wonder XL24 *(with 1 MB)* ..... 149.
3886 Graphics Ultra + *(with 2 MB)* ..... 339.
3871 Graphics Ultra Pro *(with 2 MB)* ..... 519.

Delrina Technology
10454 ▣*Windows Communications PAK*—Solves all your communications needs. This value packed bundle includes the award-winning *WinFaxPro 3.0, Crosstalk for Windows,* and *SuperStor Pro* ..... **$145.**

Boca Research ... 5 years
10468 SVGAX3 *(with Bit BCT acceleration)* ..... 149.
7150 BOCARAM/AT PLUS *(2 MB)* ..... 169.
7139 *(4 MB)* ..... 239. 7138 *(8 MB)* ..... 449.
6998 I/O Board for AT.. 49. 6999 for PS/2 ..... 89.
8380 BasicVGA..... 49. 8381 SuperVGA..... 115.
Caere ... 1 year
8158 Typist Plus Graphics ..... 299.
Canon ... 1 year
We are an authorized Canon Service Center.
7893 BJ-10ex BubbleJet Printer *(4.6 lb.)* ..... 255.
7809 BJ200 BubbleJet Printer ..... 369.
8940 BJ-C800 Color BubbleJet Printer ..... 1899.
7897 BubbleJet Ink Cartridge *(BJ-10ex)* ..... 23.
Cardinal ... lifetime
8690 MVP24I Modem Value Pack ..... 39.
7667 MVP96IF FaxModem Value Pack ..... 195.
Compaq Computer ... 3 years
9548 ProLinea 3/25s with 84 MB, Windows *(monitor not included)* ..... 919.
9549 ProLinea 4/25s with 240 MB, Windows *(monitor not included)* ..... 1399.

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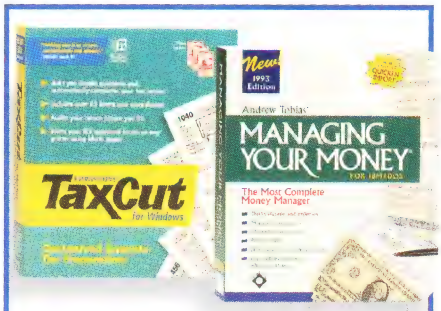

MECA
Up to $30 in rebates direct from MECA (limited time—call for details).
2798 ▣*Managing Your Money 9.0* ..... **$32.**
4603 ▣*TaxCut 1992* ..... **37.**
▣*State Tax Packages* ..... ***ea.* 32.**

9554 LTE Lite/25c with 84 MB ..... 3289.
9553 LTE Lite/25c with 120 MB ..... 3589.
9552 Contura 3/25 with 120 MB, Windows ..... 2059.
9551 Contura 3/25c with 120 MB, Windows ..... 2629.
9550 Contura 3/25c with 84 MB, Windows ..... 2349.
CoStar ... 1 year
10300 Address Express ..... 689.
COVOX ... 1 year
5543 Sound Master II ..... 145.
Creative Labs ... 1 year
8578 Sound Blaster.. 99. 2336 Sound Blaster Pro 189.
5770 Sound Blaster 16 ..... 229.
Curtis ... lifetime
7358 Command Center SPF-4 ..... 79.
Cyrix Corporation ... 5 years
9877 FasMath 83S87-16 *(SX compatible)* ..... 69.
9875 FasMath 83D87-25 or 9876 83D87-33 ..... *ea.* 89.
Diamond Computer ... 5 years
10079 Stealth 24 Graphics Accelerator ..... 165.
8333 SpeedStar 24X Graphics Accelerator ..... 165.
Epson ... 2 years
We are an authorized Epson Service Center
5555 AP-3250 *(80 col., 200 cps, 24 pin)* ..... 199.
2358 LQ-570 *(80 col., 252 cps)* ..... 259.
2361 LQ-870 *(80 col., 330 cps)* ..... 489.
2357 LQ-1170 *(136 col., 330 cps)* ..... 669.
Hauppauge Computer ... 1 year
4008 Win/TV ..... 439.
Hayes ... 2 years
9039 Accura 2400 *(ext.)*.... 85. 9033 *(internal)* ..... 79.
7391 ULTRA 96 Modem.. 599. 5024 ULTRA 144 . 669.
1345 OPTIMA 24 Modem 125. 3522 OPTIMA 96 . 349.
8187 OPTIMA 24+FAX96 ..... 159.
7395 OPTIMA 144+FAX144 ..... 479.
Hewlett-Packard ... 1 year
7620 DeskJet 550C *(color) (with ink cartridge)* ..... 789.
9993 LaserJet IIIP *(with toner)* ..... 1099.
6442 LaserJet 4 *(with toner)* ..... 1499.
Intel ... 3 years
3864 14.4EX Modem ..... 469.
1086 Matched Memory Classic Memory Board ØK .... 95.
8479 Above Board ISA ØK ..... 189.
10436 SatisFAXtion Modem 300 ..... 299.
5994 Modem 400..... 399. 5995 Modem 400E..... 449.
5999 ▣FAXability Plus *(software)* ..... 79.
6003 ▣FAXability Plus OCR *(software)* ..... 165.
2994 EtherExpress 16 or 3021 16 TP ..... *ea.* 129.
MATH COPROCESSORS
4750 80387SX *(all 80386SX CPU's)* ..... 79.
5409 80387DX *(all 80387DX CPU's)* ..... 85.
Kensington Microware ... 1 year
Full line available. Partial listing.
2582 MasterPiece Plus..... 95. 2587 Remote..... 105.
7899 Expert Mouse *serial*... 99. 7900 *bus* ..... 115.
Key Tronic ... 3 years
4518 101 Plus Keyboard ..... 99.
4387 Trak 101 Keyboard *(with trackball)* ..... 165.
KOSS Corporation ... lifetime
5459 HD-4 speakers with equalizer ..... 49.

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✗	✓	***FIRST*** **to ship real-time data compression software!**
✗	✓	***FIRST*** **to offer software performance equal to that of hardware solutions!**
✗	✓	***FIRST*** **to compress data on floppies, removable hard disks, and Bernoullis®!**
✗	✓	***FIRST*** **to offer the ability to shrink or expand the size of compressed drives!**
✗	✓	***FIRST*** **to provide menu-driven installation!**
✗	✓	***FIRST*** **to be featured in a major disk operating system (DR DOS® 6.0)!**
✗	✓	***FIRST*** **to recognize whether a diskette is compressed or not (Automount)!**
✗	✓	***FIRST*** **to offer Recompress, providing up to 25% more compression performance (over ver 1.3)!**
✗	✓	***FIRST*** **to offer Universal Data Exchange (UDE) that lets anyone read your compressed data on any PC!**
✗	✓	***FIRST...!***

Circle 2 on reader service card

PC WORLD TEST CENTER REPORT

DX2-66s: To the Swiftest Go the Spoils

	Excel 4.0	Word for Windows 2.0	Paradox 3.5 in DOS window	Freelance for Windows 1.0	BAPCo SYSmark92**
Tangent Computer Model 466ex*	93	112	118	157	179
Lodestar 486LB DX2/66 Winstation*	91	111	132	145	168
Hertz Computer 486/D66X2e*	88	109	130	146	163
Axik Computer Ace Cache 486DX2-66*	90	107	122	160	163
Tri-Star Computer 486/66 DX2 VL-Station	83	102	164	108	150
Gateway 2000 4DX2-66V*	88	106	143	110	148
DFI 486-66 DX2	96	85	167	154	137
AST Bravo 4/66d Model 123B	103	138	125	133	147
ATronics Int'l ATI-486/66	90	109	148	132	134
Compaq Deskpro 4/66i Model 120/w	88	110	128	141	125
Blackship Computer BLK 486DX2/66	86	153	152	106	135
PowerBox Systems PBS1 466I	116	145	133	146	147
Zenith Data Systems Z-Station 466XEh	109	144	141	142	142
First Computer Systems FCS 486-66	95	110	162	169	131
CAF Technology CAF Gold 6B2	106	140	144	133	134
Amax 486DX2/66 MHz ISAmax System	108	125	163	195	141
NEC PowerMate Express 486DX2/66e	104	134	134	160	129
Swan Technologies 486DX-66DB	109	117	168	158	127
Dell Computer 486D/66	113	152	154	143	133
DEC DECpc 466d2 LP	104	116	163	165	122
Quill Computer Qtech 486DX/2 66ET	108	118	171	171	123
Acer AcerPower 486e DX2/66 Model 5657	102	132	159	127	114
EPS Technologies 486-DX2 66	114	146	169	148	120
Hyundai Electronics 466D2	119	115	181	125	106

***Best Buy**

Systems are arranged in order of overall speed, from fastest at top to slowest at bottom.

****All test results in seconds except for the BAPCo test, which measures scripts per hour.**

Methodology
All tests were run using systems configured as standard. If we had to install *Windows*, we performed the default installation. We configured *Windows* with a Hewlett-Packard LaserJet III as the default printer, disabled Print Manager, and attached a null printer to LPT1. Using vendor-supplied video drivers when possible, we set the resolution to 800 by 600 pixels. On systems unable to support 16 colors at that resolution, we used 256.

Excel 4.0
We perform several data extracts; build and format a financial statement and print it; and open a mortgage analysis, scroll, move blocks, change the interest rate, print preview the statement, and save it.

Word for Windows 2.0
We use the spelling checker and scroll through a 27-page document; create, format, print, and save a single-page business letter; and open a business proposal, add a paragraph, and preview and print the proposal.

Paradox 3.5 in DOS window
Running the program in a DOS window, we perform a variety of data entry, record searching, and updating tasks. Then we generate reports using a simple customer list.

Freelance for Windows 1.0
We load a single-page starter file containing a United States map with each state a separate object. Then we build a six-page presentation using charts and preview it five times with different effects. Finally, we save the presentation to disk.

BAPCo SYSmark92
We run a scripting program that loads common database, desktop publishing, presentation graphics, software development, spreadsheet, and word processing applications and executes a variety of typical tasks with each. The following software packages are used in this test: *Aldus PageMaker 4.0, dBASE IV 1.1, Harvard Graphics 3.0, 1-2-3 3.1, Microsoft C 6.0, Microsoft Excel 3.0, Microsoft Word for Windows 2.0, Paradox 3.5, Quattro Pro 3.0,* and *WordPerfect 5.1.*

Testing performed by Susan Silvius and Ulrike Diehlmann. Data based on tests designed and conducted by the PC World Test Center. All rights reserved.

FEATURES COMPARISON

All This and Speed, Too

● Yes
○ No
n/a = not applicable

	Acer America AcerPower 486e DX2/66 Model 5657	Amax Engineering ISAmax System 486DX2/66 MHz	AST Bravo 4/66d Model 123B	ATronics Int'l ATI-486/66	BEST BUY Avik Computer Ace Cache 486DX2-66	Blackship Computer Systems BLK 486DX2/66	CAF Technology CAF Gold 6B2	Compaq Computer Deskpro 4/66i Model 120/w	DEC DECpc 466d2 LP	Dell Computer 486D/66
Standard features										
Direct/street price 11/10/92 [1]	$2962	$2746	$2340	$2995	$2595	$2345[2]	$2042	$2626	$2284	$3218
Bus	EISA	ISA	ISA	ISA	ISA	ISA	ISA	ISA	ISA	ISA
BIOS	Acer	AMI	AST	AMI	AMI	AMI	AMI	Compaq	Phoenix	Phoenix
Chip set	OPTi	USA/UMC	AST	UMC	Contaq	ALI	SIS	Compaq	OPTi	VLSI
Power supply: maximum DC output (watts)	200	250	145	250	250	200	200	145	145	224
Hard disk	Conner CP30204	Conner CP30204	Quantum ProDrive LPS	Maxtor LXT340A	Quantum ProDrive LPS	Maxtor 7213AT	Maxtor 7213AT	Quantum ProDrive LPS	DEC LR74992	Quantum ProDrive LPS
Size (MB)/type	203/IDE	203/IDE	116/IDE	321/IDE	116/IDE	202/IDE	202/IDE	116/IDE	234/IDE	116/IDE
Caching controller	○	●	○	○	●	○	○	○	○	○
Floppy drives: 1.2MB/1.44MB/combo	1/1/0	1/1/0	1/1/0	1/1/0	1/1/0	1/1/0	1/1/0	1/1/0	1/1/0	0/0/1
Parallel/serial/mouse/other ports	1/2/0/1	2/2/0/0	1/2/1/0	1/2/0/1	1/2/1/1	1/2/0/1	1/2/0/1	1/2/1/1	1/2/1/0	1/2/1/0
Case	desktop[6]	compact	compact	tower	minitower	minitower	minitower	compact	compact	compact
Graphics board/integrated chip	Acer Power-Vision	NDI Volante Warp10	integrated CL-GD54-22-75QC-A	Diamond Stealth VRAM	ATI Graphics Ultra	Cirrus Logic GD542X VGA	OEM card with WDC 90C31	integrated Compaq QVision	integrated S3 924	integrated WDC 90C31
Expandability										
Maximum clock speed	50	50	50	50	50	50	50	33	50	33
Clock speed adjustment method	set jumpers	replace clock	set jumpers	replace clock	set jumpers	replace clock	replace clock	set switches	set jumpers	set jumpers
CPU ZIF socket	○	○	●	○	●	○	○	○	○	○
Total/free 32-bit slots	6/4	0/0	0/0	1/1	1/1	0/0	0/0	0/0	0/0	0/0
Total/free 8/16-bit slots	2/2	8/5	4/4	7/5	8/5	5/4	8/6	3/3	3/3	6/6
Total/free 8-bit slots	0/0	0/0	0/0	1/1	0/0	2/2	0/0	0/0	0/0	0/0
Externally accessible 5¼-inch/3½-inch drive bays	3/1	3/1	2/0	6/0	3/2	2/2	2/2	1/1	1/1	3/0
Internal 5¼-inch/3½-inch drive bays	0/2	0/0	1/1	0/3	0/3	1/0	0/1	0/1	0/2	0/1
Maximum RAM (MB)	256	32	64	64	32	32	32	32	64	64
External cache/maximum external cache (K)	256/256	64/256	256/256	256/256	256/256	256/256	256/256	64/64	256/256	0/0
Cache type	direct-mapped write-back	direct-mapped write-back	direct-mapped write-back	direct-mapped write-back	direct-mapped write-back	direct-mapped write-through	direct-mapped write-back	two-way set associative write-through	direct-mapped write-back	n/a
Service and support										
Warranty (months)	12	12	12	12	12	12	12	36	12	12
On-site service price per year	free	$75	free	$99	free	free	n/a	free	free	free
Turnaround policy (days)	7	7	2	3	2	2	4	none	2	none
Free unlimited support	●	●	●	●	●	●	●	●	●	●
Toll-free central support	●	●	●	●	●	●	○	●	●	●
Daily support (hours)	12	11	14	9	9.5	9	9	24	11.5	18
Weekend support	●	●	●	○	●[8]	○	○	●	○	●
BBS	●	●	●	○	●	●	○	●	●	●
Fax	●	●	●	●	●	●	●	●	●	●
Vendor-to-dealer support										
Dedicated support staff required for dealers	○	○	○	n/a	n/a	n/a	●	○	n/a	n/a
Dealer support staff training required	○	○	○	n/a	n/a	n/a	●	○	n/a	n/a
Dedicated support line for dealers	●	○	●	n/a	n/a	n/a	●	●	n/a	n/a
Parts inventory required of dealers	○	●	○	n/a	n/a	n/a	●	○	n/a	n/a

[1] Except as noted, all systems include 8MB RAM, 100MB or larger hard drive, two floppy drives, super VGA, color monitor, serial and parallel ports, keyboard, mouse, Windows 3.1, and DOS 5.0. Price is either direct or the lowest price we found in calls made to multiple dealers.

[2] Includes PowerMenu Plus and McAfee Virus Scan.

[3] Includes choice of major application.

	DFI 486-66 DX2	EPS Technologies 486-DX2 66	Systems FCS 486-66	First Computer 4DX2-66V (BEST BUY)	Gateway 2000 486/D66X2e (BEST BUY)	Hertz Computer 466D2	Hyundai Electronics Winstation (BEST BUY)	Lodestar Computers 486LB DX2/66	NEC PowerMate Express 486DX2/66e	PowerBox Systems PBS1 466i	Quill Computer Products Qtech 486DX/2 66ET	Swan Technologies 486DX-66DB	Tangent Computer Model 466ex (BEST BUY)	Tri-Star Computer 486/66 DX2 VL-Station	Zenith Data Systems Z-Station 466XEh
	$3767	$2645	$3299	$2875[3]	$2895	$2448	$3329	$4102[4]	$2899	$4150	$3305	$3345[4]	$3695	$4297[4,5]
	ISA	ISA	ISA	ISA	ISA	ISA	ISA	EISA	ISA	EISA	ISA	ISA	ISA	EISA
	AMI	AMI	AMI	Phoenix	AMI	AMI	AMI	Phoenix	AMI	AMI	AMI	Award	Phoenix	Signetics
	UMC	Contaq	ETEQ	Micronics	ETEQ	OPTi	UMC	Intel	C&T	OPTi	VLSI	HINT/SIS	Micronics	Intel
	200	200	300	200	200	200	250	285	250	250	200	200	220	300
	WD Piranha 4200	Maxtor 7213AT	WD Caviar 2200	WD Caviar	Maxtor 7213AT	Conner CP30104	WD Caviar 2200	Maxtor LXT535SY	Maxtor 7213AT	Maxtor LXT340SY	Maxtor 7213AT	Maxtor 7213SR	Maxtor 7120A	WD Caviar 2200
	202/IDE	202/IDE	203/IDE	202/IDE	202/IDE	116/IDE	203/IDE	509/SCSI	202/IDE	324/SCSI	202/IDE	202/SCSI	202/IDE	203/IDE
	○	○	●	○	●	○	●	●	●	●	○	●	○	○
	1/1/0	1/1/0	1/1/0	1/1/0	1/1/0	1/1/0	1/1/0	0/1/0	1/1/0	0/0/1	0/0/1	0/1/0	1/1/0	0/1/0
	1/2/0/1	1/1/0/2	1/2/0/1	1/2/0/0	1/2/0/1	1/2/1/0	1/2/0/1	1/2/1/1	1/2/1/1	1/1/0/1	1/2/0/0	1/2/0/2	1/2/0/0	1/1/1/1
	compact	desktop	tower	desktop	compact	compact	tower	compact	tower	tower	desktop	minitower	tower	compact
	integrated Tseng ET4000AX	Orchid Fahrenheit VA	Orchid Fahrenheit 1280	ATI Graphics Ultra Pro	Diamond SpeedStar 24X	ATI Graphics Ultra Pro	GA-300	integrated Tseng ET4000	ATI Graphics Ultra	STB WinD/X	integrated S3 924	Diamond SpeedStar 24X	ATI Graphics Ultra Pro	integrated ATI
	33	50	50	50	50	33	50	33	50	50	50	50	33	33
	replace CPU board	replace clock	replace clock	set jumpers	set jumpers	set jumpers	replace clock	replace CPU board	replace clock	replace clock	replace CPU board	replace clock	set switches	replace CPU board
	○	○	○	○	○	●	●	●	○	○	○	○	○	○
	1/0	0/0	0/0	2/1	0/0	1/0	2/1	5/4	0/0	8/5	0/0	3/1	0/0	4/4
	5/4	6/4	7/4	6/6	6/3	6/6	5/4	0/0	8/5	0/0	6/5	5/4	8/7	0/0
	2/2	2/2	1/1	0/0	2/2	0/0	1/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
	2/1	2/2	4/0	3/0	3/2	3/2	6/2	4/0	4/0	6/0	3/0	2/2	4/0	2/0
	1/0	2/0	2/2	2/0	0/0	0/1	0/0	2/0	2/2	1/0	0/1	0/1	2/2	0/2
	64	64	64	64	32	64	32	256	32	256	64	128	64	128
	256/256	256/256	256/256	64/256	64/256	128/256	256/256	128/128	64/256	256/512	128/128	128/256	256/256	128/128
	direct-mapped write-back	direct-mapped write-back	direct-mapped write-back	direct-mapped write-through	direct-mapped write-through	direct-mapped write-back	direct-mapped write-back	direct-mapped write-through	two-way set associative write-back	four-way set associative write-back	"most frequently accessed" write-back	direct-mapped write-back	direct-mapped write-back	direct-mapped write-through
	12	36	12	12	12	18	24	12	24	12	24	12	24	12
	free	free	n/a	free	$295	varies	free	free	free	free	free[7]	free	free[7]	varies
	none	2	1	none	1	2	7	3	1	2	none	none	4	2
	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	●	●	●	●	●	●	●	●	●	○	●	●	●	●
	9.5	12	9	18	9.5	24	9.5	14	10	10	12	9	12	15
	○	●	○	●	○	●	●	○	○	○	●	○	●[8]	○
	●	●	○	●	○	●	○	●	○	○	●	●	●	●
	●	●	●	●	●	●	●	●	●	●	○	●	●	●
	○	n/a	○	n/a	n/a	○	n/a	●	n/a	n/a	n/a	n/a	n/a	n/a
	○	n/a	○	n/a	n/a	○	n/a	●	n/a	n/a	n/a	n/a	n/a	n/a
	○	n/a	●	n/a	n/a	●	n/a	●	n/a	n/a	n/a	n/a	n/a	n/a
	○	n/a	○	n/a	n/a	●	n/a	○	n/a	n/a	n/a	n/a	n/a	n/a

[4] Has only one floppy drive.

[5] Includes Windows for Workgroups, plus network client shells for Novell NetWare, LAN Manager, and Banyan's VINES.

[6] Also configurable as tower.

[7] Free for two years.

[8] Saturday only.

BELIEVE IT OR NOT, YOU COULD SAVE A LOT OF TIME BY READING THIS AD.

Fact is, it'll take you about ten minutes to read this ad. Which is about ten times longer than it would take you to read most of the other ads in this publication.

But when you see how much time this remarkable new information manager can save you by organizing your life and managing your work, chances are you'll decide they were the most profitable ten minutes you've ever spent.

LET'S BEGIN THIS LENGTHY AD WITH A BRIEF HISTORY.

Commence was developed by Jensen-Jones, the folks who created IBM Current,™ so naturally it comes with all of the standard features you'd expect in a PIM. Including everything you need to organize and prioritize your tasks, meetings, business contacts, schedules and more.

But Commence goes much, much further, to the point of rendering other PIMs obsolete.

How? By redefining PIM customizability in a way that makes it astonishingly easy to tailor Commence to your specific needs and applications. All with the point and click ease of Microsoft® Windows.™

And, perhaps most important, it's the first PIM that features task automation. Using a revolutionary breakthrough called agent technology, Commence actually does work for you – automatically.

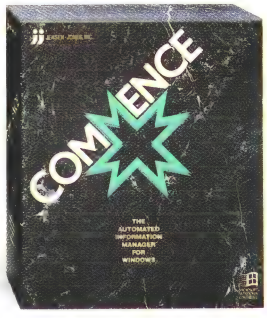
Now that we have given you a taste of the really intriguing stuff, let's go back to the basics for a minute.

USE IT AS IS, OR CUSTOMIZE IT TO FIT YOUR NEEDS. IT'S YOUR CHOICE.

Commence can go to work for you right out of the box, with two ready-to-use databases and a variety of standard views. But, unlike most PIMs that let you make only minor adjustments, you can completely customize Commence for the unique requirements of your business, industry or firm.

Whether you're running a small start-up or an entire department of a multinational firm, you can add, create or rearrange fields, views, categories and connections so that Commence works the way you work.

If you need to view your customers by size, by region or other criteria, no problem. Want to keep track of your truck fleet's mileage? The status of your inventory? Distribution of your equipment? With Commence, it's simple.



The world's most powerful PIM.

Here's just a partial list of some of Commence views you can use right out of the box or modify to suit your needs:

- Address book
- Appointment calendar
- Billing report
- Expense report
- Free form notes
- Gantt view of tasks
- Letter log
- To-Dos
- Phone log
- Projects and any other views you want

YOU'LL BE AMAZED AT WHAT OUR SPECIAL AGENTS CAN DO.

Now, a few words about an advanced new technology called *agents*. Much more powerful than traditional macros, agents let you totally automate many of the tasks you used to do yourself.

First, you select a *trigger* that will activate an agent. Then specify the *action* you want to take place. For example, you can specify time triggers, such as at 5PM every day, or at ten in the morning the first day of every month.

Or you can specify data triggers, such as every time a sales order exceeds $5,000, or when inventory drops below 25 units.

You can then specify actions that will alert you, display some data that you need, execute another command, launch an application, etc.

The next time all the conditions specified in the trigger are met, the actions you asked for will automatically occur.

Now, if you've come this far and haven't nodded off yet, do keep on reading because we are about to get to the really good stuff.

THESE FEATURES CAN'T BE BEAT. IN FACT, WITH ANY OTHER PIM THEY'RE NOT EVEN AVAILABLE.

By now you're probably thinking, "Okay, I sort of understood that last section, but what can these agents and triggers do for *me*?" Well, here are some rather extraordinary examples. Commence can:

- *Automatically* print a report of your daily appointments and their details every morning at 9:00.
- Print out your To-Dos and calendar for the next week the evening before you're scheduled to travel.
- Mark all of today's incomplete To-Dos as overdue and assign them to tomorrow's project list.
- *Automatically* fax a flower delivery authorization to your florist for any customer who places an order over $10,000.
- Display a view each morning at 9:30 of every customer who hasn't placed an order in two weeks.
- Send yourself a reminder one week in advance of any scheduled presentations so that you'll have adequate time to prepare.
- *Automatically* switch any task that contains the words "urgent" or "immediately" to your priority message list.
- Run a disk diagnostic program Thursday at midnight and save the results.

As you can see, the possibilities for saving time and simplifying your life are (like this ad) almost endless.

COMMENCE CAN TAKE CARE OF YOUR TOUGHEST APPLICATIONS WITH EASE.

All the customizability that Commence brings to standard PIM functions also lets you handle much bigger applications with equal ease. Here are just a few of them:

- Sales contact management
- Meeting and appointment scheduling
- Assigning and tracking daily tasks
- Company time and resource allocation
- Project management
- Expense tracking, reporting and auditing
- Customer database management
- Telemarketing sales management
- Inventory tracking and control

STANDARD FEATURES THAT ARE SETTING NEW STANDARDS.

Before sending you off into the crowded PIM marketplace, we'd like to elaborate a little more on some of our standard features.

Flexible calendar and scheduling lets you view meetings, To-Dos and travel in monthly, weekly or daily views. You can automatically schedule events on recurring dates. It even prints in familiar day planner format.

True database power lets you record up to 8,000 items per category with up to 100 categories per database, and keep multiple databases. Each item can have up to 50 fields and connections. You can even include graphics images in category items.

Powerful connections facility lets you totally integrate your information. Connect people to projects, notes to tasks, appointments to people, and more. Type information once, and it automatically appears in all relevant views. Commence has built-in connections, or it's easy to set up your own.

DDE links to other Windows applications give you dynamic access to information in Commence from word processors and spreadsheets.

Letter templates let you write a variety of standard form letters that you can send to people on your customer and contact lists – one at a time, or several at once.

Spell checker ensures proper spelling in your text entries.

Powerful import/export facility lets you exchange data with your other applications, as well as with your other Commence databases.

Auto phone dialer automatically dials all appropriate numbers including area and international codes.

Built-in letter writer allows you to take advantage of Commence's integration with other Windows word processors, like Microsoft Word for Windows™ and Lotus® Ami Pro.™

Extended sorting and filtering capability lets you set up to four criteria so you always see exactly the information you want.

Built-in Gantt charting gives you a graphical snapshot of task status.

TRY COMMENCE ABOSLUTELY *RISK-FREE*.

In addition to winning new customers every day, we're also winning new awards. Commence was just given a W100 Windows Magazine 1993 Annual Win Award. And an InfoWorld Buyer's Assurance Seal, as well.

So, now that we've gone to such abundant length and copious detail to explain what Commence can do, you probably want to know how much it costs: the list price is just $395, including a 60-day money back guarantee. So you can try it risk-free.

Once you see for yourself the many ways Commence can help you work more efficiently, you'll realize that time isn't the only thing you're saving.

COMMENCE™
THE AUTOMATED INFORMATION MANAGER FOR WINDOWS

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MULTIMEDIA PC

3½" Drive Included.
5¼" Drive Available. Call for details.

THE SMART CHOICE 486DLC/33 MULTIMEDIA PC

Plug n' Play multimedia with audio-CD-quality stereo sound, the brute force of 486DLC/33 processing technology and a powerful built-in Multimedia CD-ROM Reader. This is an amazing value — perfect for a variety of multimedia applications. The possibilities of CD-ROM are endless as multimedia emerges as the breakthrough of the 90's.

If you're thinking of upgrading to 486 technology, why not add the capability of full-motion video and sound? Put this system on your desktop and watch the sparks fly. Multimedia games leap to life with rich, Pro Audio Spectrum sound. Presentations become unforgettable events. Learning is enriched, in fact, this is a great horizon-expanding tool for children. While nothing will ever replace the wonderful experience of reading, multimedia can bring the characters of literature and the heroes of history alive.

This is a milestone in the evolution of the modern personal computer, harnessing the power to record sounds, mix them with other sounds, add music and special effects. Imagine being able to click on Beethoven and hear his work, or click on Harry Truman and listen in on one of his memorable political speeches. Click again as Neil Armstrong speaks from the Sea of Tranquility.

The enhanced VGA card pumps out vibrant colors; 1024 by 768 in 16-color mode and 800 by 600 in 256-color mode with .28 dot pitch.

There's 4Mb of RAM (expandable to a whopping 36Mb), a strict password system, an enhanced 101-key keyboard, a mouse and a serial and parallel port. Of course, Pro Audio Spectrum is already loaded and ready to go. This 16-bit stereo beauty packs a built-in 4 watt per channel amplifier and twin FM chips for 20 voice sound. Plus, two other 16-bit slots are available.

To hear all this great sound, we've included the phenomenal, Deluxe Koss amplified, high-efficiency stereo speakers. Or, if you want private stereo sound, just slap on the headphones we've included with this system.

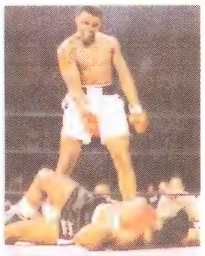
When you purchase one of these fine systems, you'll get toll-free 800 technical support and an all-inclusive one-year, on-site warranty.

ALSO AVAILABLE: THE SMART CHOICE 486DLC/33 PC

An amazing value, humming with pure 486 power and bursting with brilliant SuperVGA color. Upgrading from a 386 for home or office? This fabulous performer — available from us for just $1595 — comes complete with a 85/170Mb hard drive (with compression), a 3.5 inch drive (optional 5.25 drive available), 4Mb RAM, SuperVGA (.28 Dot Pitch) monitor, a mouse — and a truckload of great software. Over $1390 in current-release titles! All for just $1595!

INCLUDES OVER $1390 IN FREE SOFTWARE!

Includes: Mouse, DOS 5.0, Windows 3.1, SuperStor PRO, Lotus 1-2-3 v1.1 For Windows, Ami Pro 3.0, Freelance Graphics, cc:Mail, Lotus Organizer, Norton Desktop for Windows, Norton Backup, Norton AntiVirus, Game Pak I, ChessMaster 2000, Chuck Yeager's Flight Trainer, The Hunt For Red October, Airplane Factory, Life & Death I, Symantec Game Pack For Windows and WindEase 3.1. It's an unbeatable price on a powerful system.



SPEC SHEET

SMART CHOICE MULTIMEDIA 486DLC/33

486DLC/33 Technology
85/170Mb Hard Drive *(with compression)*
4Mb RAM
Built-in Multimedia CD-ROM Reader
Built-in Pro Audio Spectrum 16 Sound
SuperVGA Monitor (.28 Dot Pitch)
One Year On-Site Warranty

Smart Choice 486DLC/33	$2112.50
Multimedia CD-ROM Reader	$599.00
Complete Media Vision 16-bit Sound Board Interface MPC Kit	$428.00
KOSS Deluxe Large Speakers	$59.99
Windows 3.1	$149.00
DOS 5.0	$99.00
Mouse	$99.00

SOFTWARE

Toolworks Multimedia Encyclopedia	$395.00
U.S. Atlas v3.01 Multimedia	$149.95
Time Table Of History: Science & Innovation	$99.95
Animals v1.0 Multimedia	$119.95
PC Karaoke Multimedia	$99.00
Library Of The Future 1st Edition	$395.00
Guiness Disc 1992 Multimedia	$59.95
US Presidents Multimedia	$49.95
Dictionary of The Living World Multimedia	$199.00
Family Doctor	$79.95
Game Pack II (12 games)	$79.95
SuperStor PRO	$149.00
CD Speedway	$99.95

Retail Value for Total System $5,523.09

Tiger Price $1,995.90

SMART CHOICE COMPUTERS

BDY5805 **Smart Choice 486DLC/33 Multimedia Computer** Multimedia System w/built-in CD-ROM & Sound	**$1995.90**
BDY5806 **Smart Choice 486DLC/33 Computer** Business/Productivity/Entertainment System	**$1595.00**

Returns for exchange only.

Circle 214 on reader service card

WINDOWS' BEST WORD PROCESSOR

One of the largest technological leaps in the word processing category in years. New Ami Pro 3.0 decisively establishes itself as Number One in Windows word processing. Microsoft Word and WordPerfect are good word processors — but keep reading and you'll discover why they'll be battling it out for the Number TWO spot for a long time to come.

The biggest advantage: POWER MADE ACCESSIBLE. In just a few minutes you'll actually be able to create your own icons and frames, enhance images, create footers, headers and footnotes — all without reading the user's guide! Everything is now done with "Drop-And-Drag" speed and ease. Another competition-killer: True WYSIWYG. Note, this is True WYSIWYG, with actual positioning, spacing and size. No guesswork. Plus, Lotus has included the Houghton-Mifflin Grammar Checker along with the speediest mail-merge in the industry.

Create truly professional documents in a fraction of the normal time, select from 13 free fonts right on your screen, create and use formats, customize the SmartIcons to do whatever you want them to. There's more, like the "Clean Screen" feature that gives you plenty of room to work, automatic envelope and label printing plus an expanded assortment of professionally designed style sheets.

INCLUDES FREE ADOBE TYPE MANAGER: If you're not familiar with this product, here's all you need to know: it makes type look great. No more "jaggies" — smooths out your fonts for great-looking screen display and incredible printed output.

ALSO FREE DASHBOARD: Quick launch your favorite applications. Drag and drop icons to set the 32 quick launch buttons to the programs you use the most, then click on the icons to start the programs at any time.

AND FREE THE PAPER DIRECT SAMPLER: Comes with dozens of paper samples for you to use. Great for use as letterheads, resumes and more. The Paper Direct software containing the templates (in Ami Pro format), allows you to print on the samples!

NEW AMI PRO 3.0

BDY5393 **Ami Pro 3.0 Competitive Upgrade** Dual Media – For Current Users Of Other Major Word Processors **$99.90**

BDY5389 **Ami Pro 3.0 Standard** Dual Media For New Users Not Upgrading From Ami or Any Other Word Processor **$229.90**

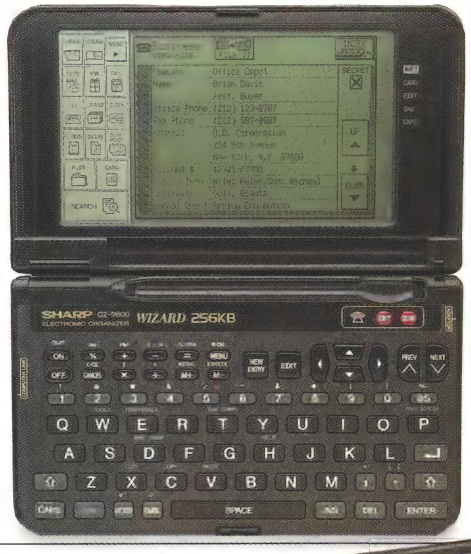
Both include Dashboard, ATM and Paper Direct Sampler In A Promotional Bundle.

ALL-NEW SHARP OZ-9600 WIZARD!

Tiger is proud to be among the first in the world to premiere an amazing little device — the Sharp OZ-9600 Wizard. If you thought you knew what Wizards were all about, you ain't seen nothin' yet. First, the new Wizard is pen-based, so you can write notes, sketch maps — or draw cartoons! Just touch the pen on any of the graphical icons to open the calendar, use the new integrated Filer system, schedule appointments, do some quick calculations or look up a phone number.

There's much more! Like the infra-red capabilities that enable the Wizard to communicate with other Wizards and send jobs to a printer — without being physically connected! This baby also features an extra-large display — five times larger than the OZ-8000 display! Plus — a new Touch Screen with pen-based, graphical interface. It's absolutely amazing — with 256K, built-in Calendar, To-Do List, Scheduler, Telephone Book, User File, Notebook, Calculator, Filer, Clock and Scrapbook!

Expand The Sharp's Mind. When you add software and memory cards to your Wizard, you put all kinds of possibilities at your fingertips. Memory and applications simply slide in the touch-sensitive screen which acts as a keypad to perform tasks, open applications — and more.



Tiger carries a complete selection of Sharp Wizards, peripherals and software. Link your Wizard directly to your PC with the amazing Organizer Link II — there's even an optional printer, modem and RAM expansion cards. Choose from software titles including: Time Expense Manager, Spreadsheet, American English Dictionary, Investment Planner, 8-Language Translator, Bible, Money Planner, Tetris, Box Jockey, Backgammon and more! Call us for details on the entire Wizard line.

SHARP WIZARD

BDY63115 **OZ-9600** 256K . . . **$499.90**

Turn Any Fax Into A Scanner!

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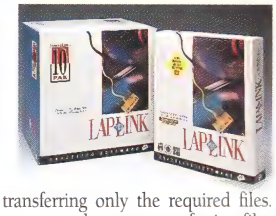

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Specify diskette size. Modem is sent directly from CheckFree when you sign up for the CheckFree service.

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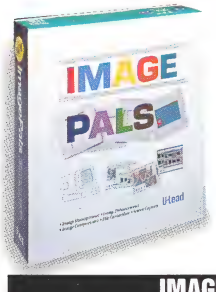

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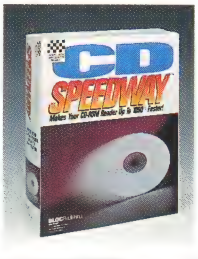

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Requires 640k RAM.

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New from Alpha Software! Haven't you ever wanted all your existing accounting, database and custom reports (even mini and mainframe reports) to look like they were desktop published? They'd have a variety of good-looking fonts, proportional spacing, shaded areas for emphasis, clip-art, scanned-in graphics, and more. Overall, your reports would communicate more effectively and have more impact. Here's great news! Now, with new Report Styler from Alpha Software, you can enhance old-fashioned reports from any of your existing software packages with a unique state-of-the-art Windows publishing program.

Report Styler Makes All Your Ordinary Reports EXTRAORDINARY. Word processors and conventional desktop publishing programs simply are not designed for styling reports. With these programs, you must style each and every line of a report individually. Report Styler is the easy-to-use Windows application that dramatically improves the look — and impact — of all your existing reports, no matter where they come from. You can use any text report, from any source — DOS, mini, mainframe, etc. And best of all, it's easy, it's quick, and it's fun!

Use Report Styler to emphasize key data, highlight important information and help your reader reach the right conclusion fast. Whether you are presenting reports internally or to key customers, or you're just tired of deciphering reams of green-bar printouts from your PC or mainframe, Report Styler makes it easy and fun to communicate, persuade, and impress.

Where Do You Get Your Reports From? Report Styler makes reports from any application more attractive and effective. Use existing reports from these sources:

- Databases
- Accounting Systems
- Spreadsheets
- Report Writers
- Project Managers
- Time Managers
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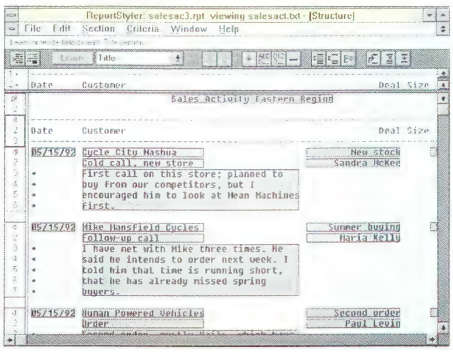
- Custom Reports
- Scanned Copy
- Anywhere!

Add Graphics. You can import pictures, logos, or clip art from graphics files on disk. Or use a scanner to scan images in from hard copy or transparencies. Pictures can be keyed to text in the report. When the data changes, so do the pictures. Images can be resized using the mouse to fit your layout perfectly.

Use Any Windows Font at Any Size. Change the look of your reports whenever you want! Use any typeface or style you like. You have control of the font, line spacing, style (choose bold, italic, underline, strike through), indents, and more with just a mouse click. That's it. Report Styler works with all Windows supported fonts and printers, including Type 1 (with ATM) and TrueType.

Specify point sizes from 4 to 1,500 in 1/10th point increments. You can even add color or gray shades to your type. Dozens of professional designer tools.



Use the Structure window to point out the different sections in a report.

Add Rules & Borders. Emphasize key points of your report with rules, boxes, and shading. Your reports will be more attractive, easier to read, and more persuasive. Rules can be hairline, one, two or four point thick. Bands (as in green-bar paper) or groups of varying size can have alternating rules and shading.

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Save Time. With Report Styler, you only have to style your report once! Report Styler remembers the structure of your last report, so your one-time investment yields effortless, attractive and effective reports every time you do your reporting. Even when data changes, or lines are added or deleted, the report comes out the way you designed it.

It's This Easy...

STEP 1 — Take Any Existing Report. You can use a report from any source — database, spreadsheet, accounting package, electronic mail, mainframe — just print it to an ACSII text file!

STEP 2 — Import the File into Report Styler. Import your existing file into Report Styler's Structure window. Point out the different sections of the report, like headers, footers and detail lines. Report Styler learns the structure almost instantly, so it begins to recognize the sections of your report after you show it just a few lines.

STEP 3 — Switch to the Style window and choose the typeface and style you like for each section of your report. Import graphics, such as logos, images and photographs, and add real style to your reports. Rearrange information and add rules, boxes and shading for emphasis and clarity. Report Styler's WYSIWYG layout lets you see exactly how your report will appear.

STEP 4 — Now Just Print! That's alls there is to it. Works with all Windows supported fonts, colors and printer. And, the next time you print the same report with new data, Report Styler will automatically do the stying. The initial time it takes to dress-up your report is a one-time investment — but your reports look great every time you print.

ALPHA SOFTWARE

BDY3653 **Report Styler** Introductory Special **$99.00**
Please specify 5¼" or 3½" diskettes.
Requires Windows 3.0 or above, mouse or other pointing device, 3MB free disk space. 2MB memory and a 386 or higher PC.

NEW REPORT STYLER FROM ALPHA SOFTWARE

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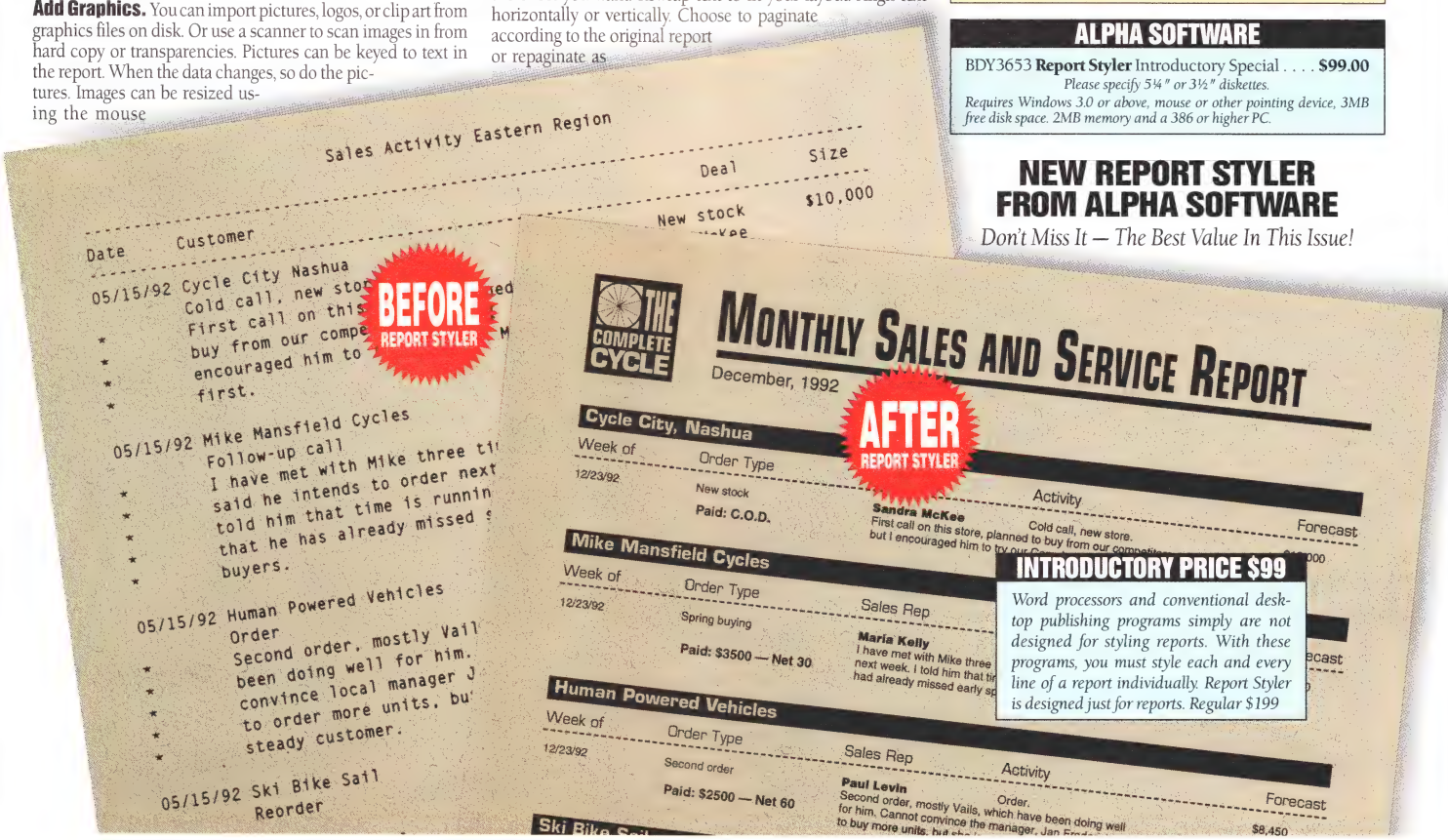

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Is Your NEW Software SECONDHAND?

When you buy shrink-wrapped software, you have a right to assume it's unused and virus-free. Our investigation reveals you may not be as safe as you think.

Jerry Mailey had installed new software countless times before. He slit open the shrink-wrap, fished the disk envelope from the box, and began to load his new copy of *QRAM*, Quarterdeck's 286 memory manager. But when he got to the registration screen, he saw someone else's name: The program was already registered to another user.

"Suddenly a message flashed on screen. *Norton AntiVirus* had picked up something. I turned the machine off in a panic," recalls Mailey, former contracts manager for JAYCOR, a government contracting firm in Vienna, Virginia.

Mailey was lucky. His virus detection software identified the Jerusalem II virus in the new software before it infected any files. But even if there hadn't been a virus lurking on those floppies, Mailey could have had a big problem on his hands: If the software was registered to someone else, he might have been unable to get technical support or the upgrade benefits afforded registered users.

"I thought shrink-wrap around software was like the safety seal around a bottle of medicine—that it meant the software was fresh from the factory," says Mailey.

It doesn't.

Judging from a *PC World* investigation into the software return and resale practices of major retailers, there's more than a slight chance that the software you're using has been used before. During the months of October and November 1992, a team of *PC World* shoppers,

BY ROBERTA FURGER

PHILIPE KLAKE

posing as everyday consumers, bought and returned software packages at 20 stores throughout the United States. Of the 39 packages purchased, four showed evidence of having been previously used, and an additional seven wound up back on the shelves for resale after we returned them to the store. That's a whopping 25 percent rewrapping rate.

The rewrapping wasn't limited to any single store or chain of stores, although some were less inclined to rewrap than others. Nor was more expensive software reshelved more often than lower-cost products. Many of the more expensive packages we bought and returned never got restocked, while relatively low-priced software found its way back on the shelves.

The results of our shopping expedition aren't projectable to every store in every chain. But the percentage of packages that were rewrapped was high enough to indicate that it's a fairly common practice. Interviews with consumers, channel watchers, and store employees confirm our findings: If you buy enough software retail, you'll eventually wind up with a rewrapped package—that is, if you haven't already.

Most consumers never know their software has been road tested by someone else. Only when the new owner's system is infected by a virus, when the registration screen identifies someone else as the owner, or when the package is incomplete, do most people realize they didn't get what they paid for.

Common Practice, But Not Common Knowledge

Virtually every major software retailer allows customers to take software home, try it out (generally for two to four weeks), and then return it if they wish. "As long as the package is complete and it's not damaged, many stores will rewrap it," reports Marcia Kaplan, director of research for Merrin Information Services, a Palo Alto, California-based research firm that tracks the retail channel.

The practice is seemingly commonplace, yet few consumers we spoke with—regardless of how many years they'd been using computers or how many packages they'd purchased—knew about it. "If they're going to recycle software they should let me know about it," says Mailey. "Then I could make the choice and decide if I want to take the risk [of buying used software]."

Customers are being naive, according to one former store manager of a major software retailer who asked that his name not be used. "Where do [they] think the software goes when they return it?" he asks, noting that one of the daily projects at his store was to rewrap all the open software. "There's no guarantee that anything on the shelves hasn't been opened."

It's a simple matter of economics, says channel watcher Kaplan. Fierce competition demands that stores offer some kind of money-back guarantee on software, but the lenient return policy means they are left with a lot of used, but not defective software on their hands. In fact, the store manager we spoke with estimated that he processed 10 to 15 returns daily, or roughly 15 percent of his sales volume.

It's too expensive and time-consuming for stores to repackage software and then return it to the software company or distributor, says Kaplan. And they can't afford to factor the cost of returns into their operating expenses. "It's getting tough out there," says Kaplan. "Competitive upgrades [handled by vendors], bundling agreements, and short product life cycles are all cutting into the margins of retailers."

Real Risk

Even customers who sympathize with retailers' economic predicament wonder what, if any, checks are in place to ensure that only pristine packages are rewrapped. And many would like to know why retailers don't notify customers of their rewrapping practices.

According to store personnel, returned software is supposed to be checked to make sure it's in "salable" condition before it's rewrapped. That means the warranty or registration card is still in

PC World Goes Shopping

We purchased software from BizMart; CompUSA; Egghead; Electronics Boutique; Fry's Electronics; Office Depot; Software, Etc.; and Waldensoftware. Although software buyers report purchasing rewrapped software from many of these chains, we found rewrapped packages only at BizMart, CompUSA, and Software, Etc. Of these firms, only Software, Etc. acknowledged that it is store policy to rewrap returned software. All others indicated rewrapping was against company policy.

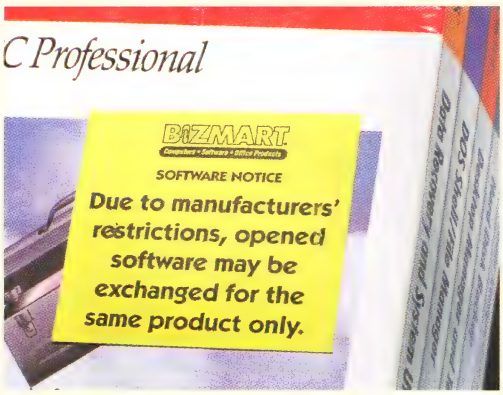
Here's what our shopping expedition uncovered: Fry's Electronics, a Northern California superstore chain, appeared to have one of the most conscientious resale policies. Clerks placed returned software in one of several bins—one for unopened packages, one for packages in which the seal on the disk envelope had been broken, and a couple for defective or altered software, which gets returned to the manufacturer or distributor.

According to one salesperson, employees load opened software onto a computer to see if it's been registered or infected with a virus. If it passes inspection it gets put on the shelf with a sticker indicating that it was opened but examined and found to be okay.

According to a Fry's spokesperson, however, official policy is that all opened software gets sent back to the manufacturer. Only packages in which the disk envelope has not been opened get reshelved.

The results of our CompUSA shopping sprees were mixed. Of the five packages we purchased, one was used, and a second got rewrapped after we returned it. According to Chief Operating Officer Keith Costein, opened software is supposed to be returned to the vendor for credit. "It's alarming that even a couple packages got rewrapped," he said.

We bought 14 packages at



BIZMART STICKERS CLAIM you may exchange software only for the same product. Not so, we found.

PHILIPE KAAKE

WALTER CALLAHAN

"I thought shrink-wrap was like the safety seal around a bottle of medicine–that it meant the software was fresh from the factory."

—*Jerry Mailey*

the box, all the disks and packaging materials are intact, and the manual hasn't been written in, highlighted, or otherwise sullied. Software that writes the user's name or identification number to disk is never supposed to make it back on the shelf.

That's the theory. But strict quality assurance procedures are not always followed. Take the experience of Charles Jackson. The Mountain View, California, desktop publisher has bought two previously used software packages in the past year. The first, *Word for Windows 2.0*, was registered to an Edmund Wong of Hong Kong. He discovered this after checking the About file when he was not prompted for his name during the installation. Jackson says he should have known something was amiss when he saw that the plastic bag holding the disks had already been torn open.

Jackson's second encounter with used software came recently when he bought a copy of Gold Disk's *Professional Draw*, a drawing package that comes with dozens of fonts and a sizable clip art library. This time the disk container (a cardboard box sealed by a small sticker with the standard copyright warning) appeared unopened, but the spine was broken on two of the manuals, as though someone had tried to photocopy them, and the font and clip art catalogs were missing. Jackson's solution: "I've started

seven Egghead stores, and not one of them made its way back on the shelf. We did buy one package, *Aldus Photostyler,* that was missing the advertised coupon for a free copy of *Gallery Effects,* but the disk envelope itself was unopened. Other than that one oversight, the store's record was unblemished.

When asked about the chain's return policy, Egghead spokesperson Megan McKenzie said all used software is sent back to the vendor. Our experience supported this statement. At nearly every store, sales personnel placed a sticker on returned items identifying the software as "Unsalable/Defective." It would be difficult, if not impossible, to take the sticker off without damaging the packaging.

We bought and returned two packages each at Waldensoftware, Electronics Boutique, and the Office Depot. None of these products were reshelved.

The same cannot be said of the BizMart stores we visited. Many of the stores prominently displayed notices to customers indicating that opened software can be exchanged only for the same package (an effort, according to one store manager, to curtail software piracy). Signs to the contrary, we were able to obtain refunds in every case (although it took some effort at a few of the stores). And in four out of five cases, the software was back on the shelf in a matter of days—with no sign indicating that it had been returned and rewrapped. In fact, a "new" copy of *Peachtree Accounting for Windows* was open when we bought it and got rewrapped *a second time,* even though we told the sales clerk the package had obviously been used before. At another BizMart, one of our shoppers overheard a clerk saying, "It's okay to wrap it up and put it back" after inspecting a package returned by one of our shoppers.

In four out of five cases, the software we bought at one store was back on the shelf in a matter of days–with no sign that it had been returned and rewrapped.

Jim Berk, BizMart president and CEO, said store personnel were "absolutely wrong" to rewrap returned software. "If the seal is broken, the software is assumed to be used. We don't sell used products."

This policy has been reiterated to all store personnel, according to Berk.

Two of the six packages we returned at Software, Etc. were rewrapped, while another two were used when we bought them. One copy of *Peachtree Complete Accounting* was missing the 3½-inch disks and the warranty card. A *Word for Windows 2.0* upgrade package was used when we bought it. Disk envelopes were open, some manuals lacked their standard shrink-wrap, the *WinWord 1.02, 2.0* Reseller License Agreement Card was bent, and the original shrink-wrap material was stuffed into the bottom of the box. In both cases, the store managers grudgingly accepted the software for return.

A spokesperson for Software, Etc. says the firm's policy is to check all returned software to make sure it's in "salable condition." If the software has been "initialized" (marked with some form of user identification), it goes back to the manufacturer. Complete and undamaged packages get rewrapped and put back on the shelf for resale. Returned packages are not identified as "used," however.

At press time, Stan Hirschman, Software, Etc. vice president of store operations, informed *PC World* of a change in company policy. Beginning January 1, all returned software was to be scanned for viruses before it was rewrapped and restocked. "We want to ensure the software's safe when we sell it to our customers," he noted.

buying software directly from the company. It's a little less convenient, but at least I know the software is passing through fewer hands."

Clearly, these packages weren't checked before they were rewrapped. And even if all the quality control measures are carefully followed, the standard checking procedure does not include a scan for viruses.

"This was not an obscure virus that infected my software," says former JAYCOR employee Mailey, referring to the Jerusalem II virus he found on his disk. "They didn't even take the first step and check the software."

"Sure we should scan for viruses," acknowledges the anonymous store manager. "But who should do it and what do we pay them?" During his four years at the software store, the number of authorized employee hours dropped from 135 to 90 per week. "We didn't have the time or resources to scan every disk," he says, adding that the only computer in the store didn't have enough hard disk space to hold virus detection software.

Are customers expecting too much? That's the opinion of one store manager. "Customers need to get their priorities straight," he says. "They want us to know everything about software; they want to be able to look at the manual before they buy a package; and they want to be able to return anything they don't like. But they also don't want it rewrapped. They can't have it both ways."

"I've started buying software directly from the company. It's less convenient, but I know the software is passing through fewer hands."

—Charles Jackson

Some customers suggest that retailers identify returned software and let customers decide if they want to take the risk of buying a used package. However, this may not be the most attractive option. "If there was an originally wrapped package and a used one, I'd take the original, even if the rewrapped package was offered at a discount," says Don Bohr, a Westminster, California, PC user who

An Ounce of Prevention . . .

Some heads-up shopping and a thorough check of new software can go a long way toward identifying rewrapped packages.

Here's what you can do:

- **Ask about a store's policy.** While most retailers don't advertise that they rewrap returns, many salespeople will tell you if it's standard practice at their store.
- **Examine packages carefully.** If there's more than one copy of a product on the shelf, take a minute to compare boxes. First, look for a different type of shrink-wrap material. For example, Central Point's shrink-wrap has small, ¼-inch holes, Peachtree's is embossed with small peaches, and Aldus adorns its packages with the company logo, generally on the bottom of the box. Some companies shrink-wrap only an inner box, which slides into an outer sleeve. Rewrapped items may get a different treatment. Also, take a look at the price tag; returned items may be marked differently.

Shopworn packages occasionally get rewrapped, so different packaging does not always indicate a used item. Nonetheless, play it safe: If there's more than one on the shelf, pick the one that looks factory-fresh.

- **Examine the contents carefully.** Ask the salesperson if you can open a package you intend to purchase. This extra step can save you a trip back to the store, but open only software you *know* you're going to buy. Otherwise, you're just compounding the rewrapping problem.

When inspecting the contents, check the following items: Are the disk envelopes sealed? Are the manuals clean? Is the warranty/registration card in the box? Next, look for the contents list—either on a separate slip or in the installation section of the manual, and make sure everything is still in the box (manuals, different media, etc.).

- **Run your disks through a virus detection utility once you've brought them home.** Some retailers rewrap the disks, making it all the more difficult to tell if the software you're getting has been returned. Look for an unbroken copyright seal on the outside of the disk envelope.
- **Save your receipt.** If the above steps fail and you wind up with a package that's already registered, you'll need a refund or another package.

—Steve Bass and Roberta Furger

TELLTALE SIGNS of new software: sealed disk envelopes, shrink-wrapped manuals, license agreement, and registration card.

BOTTOM: PHILIPE KAAKE, TOP: BOB HOLMGREN

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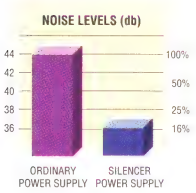

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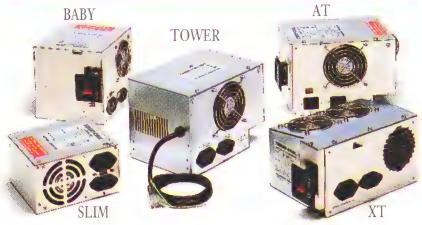

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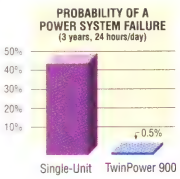

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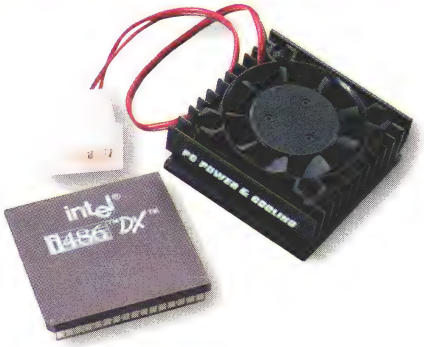

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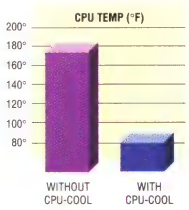

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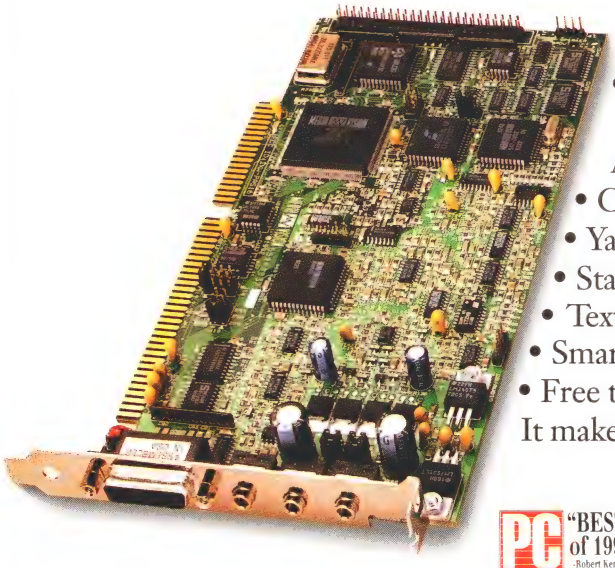

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unknowingly bought a rewrapped package. "I'd rather pay full price and get the original."

Clearly, says Kaplan, liberal return policies invite abuse—some customers figure they don't need to research purchases in advance, since they can always get their money back. Others simply use the guarantee to get free software, installing it on their systems and returning it to the store.

"I had one customer who returned something every other day all year long," recalls our anonymous store manager. "Either he was bored and it was cheaper than renting videos or he was copying software and using it illegally. It's hard to come up with a policy that will discourage abuse and still respect the rights of real customers."

While retailers struggle to find that balance, many stores continue to rewrap returned software. So, for the time being at least, be a heads-up shopper: Thoroughly check that everything's in the box and scan new software to make sure it's clean.

Roberta Furger is an associate editor for PC World. *She can be reached on PC World Online (see page 8 for more information). Freelance writers Jon Jacobi, Patrick Marshall, and Tom Marshall, contributing editors Steve Bass and Scott Spanbauer, and editorial intern Richard Melville contributed to this article.*

Many Happy Returns?

Software consumers are spoiled rotten.

That's what retail sales managers say, off the record. Sure, used software sometimes gets rewrapped and sold as new but what other industry lets you take home a $500 item, use it for 30 days, and then return it for a full refund if you're not satisfied?

To find out how software sales and return policies compare to those in other industries, we called stores that sell other forms of intellectual property—music, movies, and books—and investigated their return policies. We called a number of shops in the San Francisco Bay Area and asked how they handle returns of used, but not defective, items. While the responses varied, it's clear from our informal survey that software buyers benefit from unparalleled freedom.

Software buyers are lucky. What other industry lets you take home a $500 item, use it for 30 days, then return it for full refund if you're not satisfied?

Movies

Although it's less likely that consumers will try to return videos and laser disks, opened products can often be returned for credit. Some managers are more inclined to provide an exchange than a refund if someone just doesn't like her or his purchase. "People usually buy videos of films they're already familiar with; it's less of an impulse buy than music," says Troy Nelson, manager of Tower Video in Berkeley, California.

While music stores can't prevent consumers from making copies of records, tapes, or CDs before they return the items, most video stores "copyguard" new videocassette releases. Try to duplicate the tape, and you'll get an unwatchable copy with fuzzy lines or poor sound. Laser disks, on the other hand, have no protection.

Books

Of all the shops contacted, only bookstores would admit to reselling returned items as new. But they won't accept returns on shopworn books.

"You can tell when a book has been read," says Paul Shanahan, manager of Stacey's Bookstore, a shop that caters to the San Francisco business community. Among the telltale signs: A creased spine on a paperback, blemishes or writing on pages. "You can thumb through the book to make sure nothing's been torn out," he adds.

Most store managers say they will exchange a book that's in good condition, as long as you have a receipt and bring it back within a specified period of time; many even provide a cash refund.

But there are exceptions. Stacey's, for example, won't accept returns on study guides (such as *How to Take the SAT*) to discourage students from buying them to cram for a test and then returning them. Most stores won't take back computer books if any software included with the book has been opened, or books on tape if the shrinkwrap is broken.

Granted, spending $10 to $25 for a book, video, or CD is a lot less dicey than dropping a few hundred dollars on a piece of software. The only risk is that you may not like your purchase, while if you buy the wrong business software you can set yourself back months in training and installation costs. That's why retail software return policies are so liberal: They help remove some of the risk .

Music

Among Bay Area record shops, The Wherehouse has one of the most easygoing policies, allowing you to return any opened item (record, tape, or CD) with a receipt within 10 days for either credit or exchange. "We believe this policy takes the risk out of trying new music," says Bruce Jesse, The Wherehouse's vice president of advertising and sales promotion.

Many stores allow you to exchange an opened item even if you simply don't like it. But some, such as Amoeba Music in Berkeley, charge a 25 percent restocking fee, then resell your returned product as a used item. While no store we surveyed refuses to accept returns of open items, some go to great lengths to keep customers from bringing back items in the first place—setting up listening posts so people can try before they buy, or displaying CD booklets so consumers can read about a CD's contents.

Records, tapes, and CDs, like software, are easy to copy. That's why most managers won't take back items if they suspect customers of copying items before returning them. "If we felt someone was abusing the policy we'd refuse to honor the returns, but it's not much of a problem," says John McCord, general manager of Down Home Music, a mail-order and retail store in El Cerrito, California.

—Anita Amirrezvani

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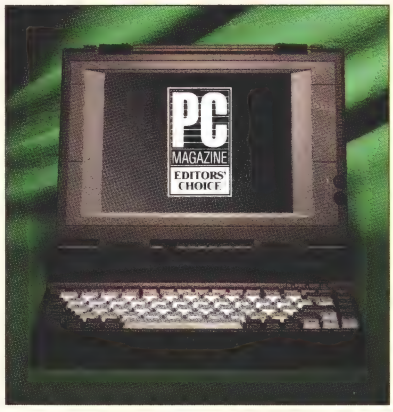

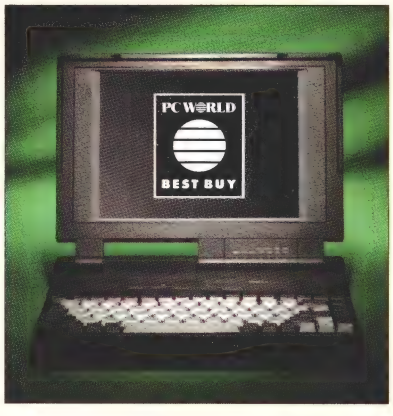

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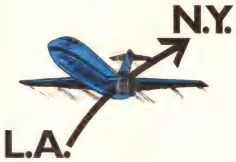

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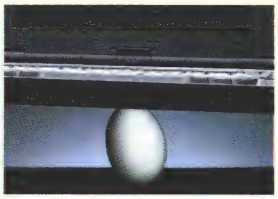

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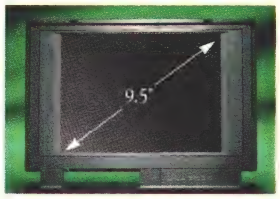

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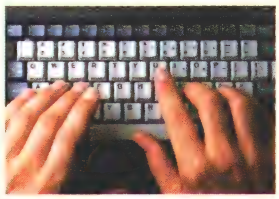

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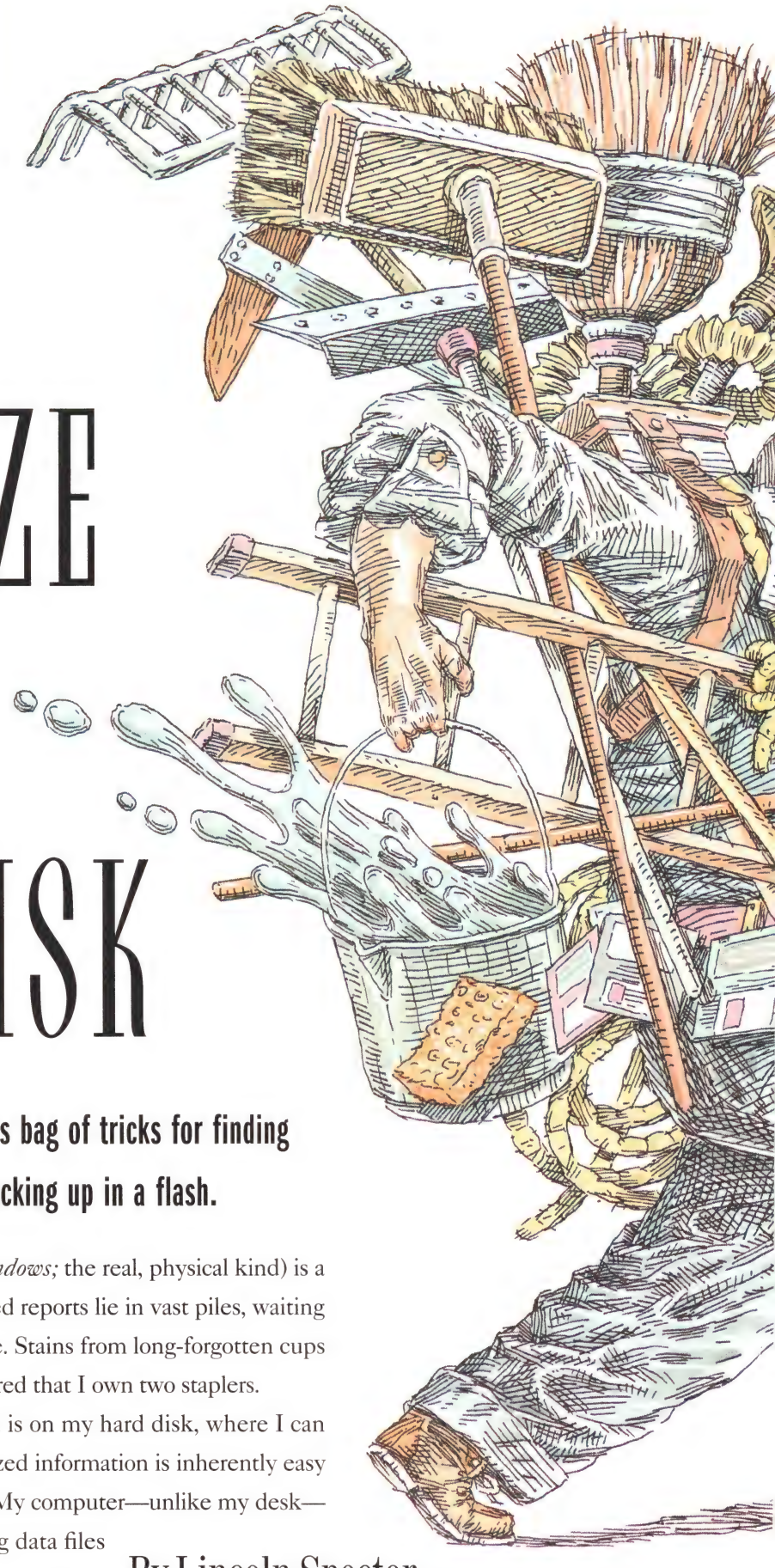
TIPS TO ORGANIZE YOUR HARD DISK

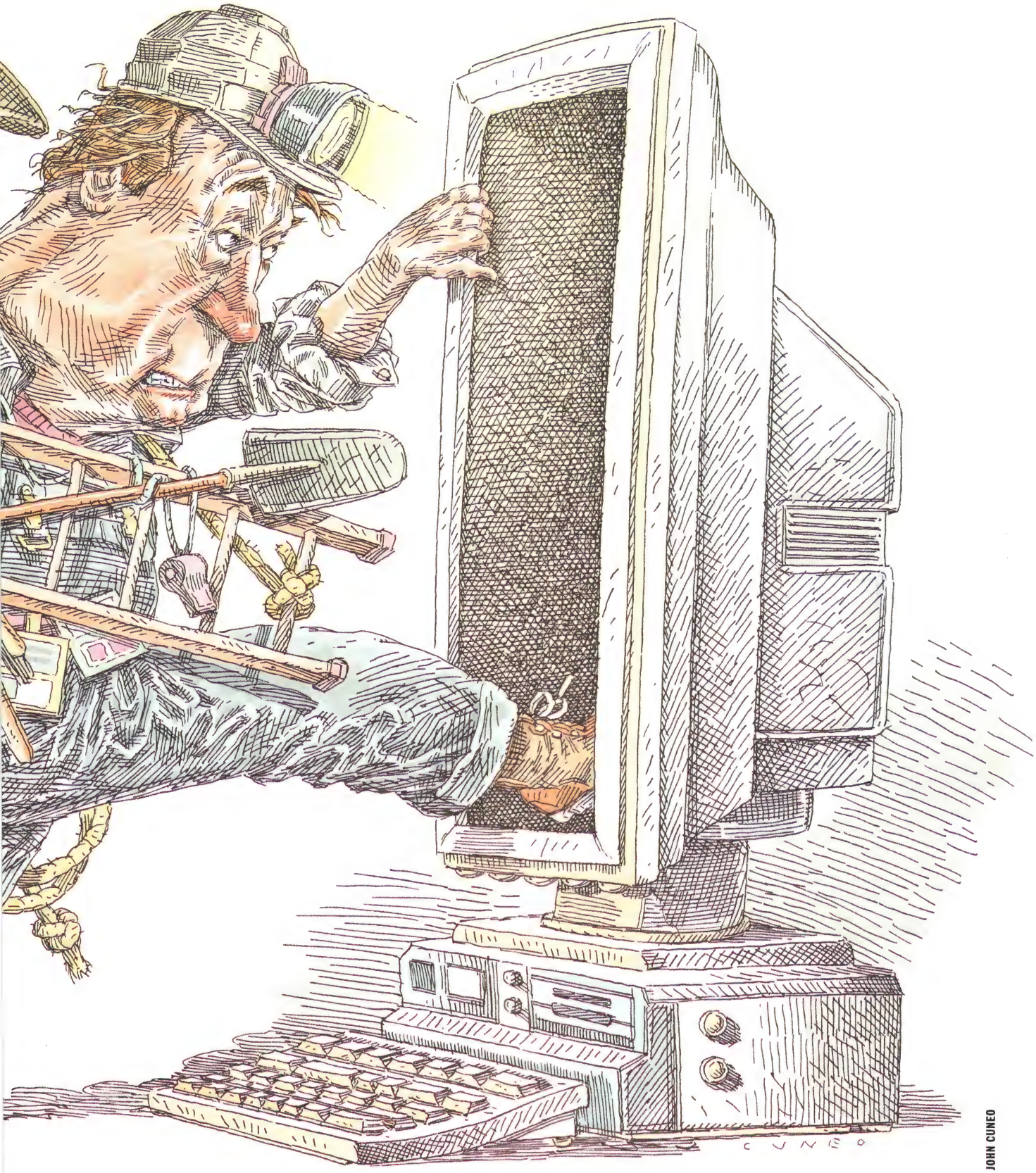


A grizzled PC World veteran shares his bag of tricks for finding files, jump-starting programs, and backing up in a flash.

By Lincoln Spector

I admit it: My desktop (not the one in *Windows;* the real, physical kind) is a mess. Old faxes, Rolodex cards, and printed reports lie in vast piles, waiting for the day when they can return to nature. Stains from long-forgotten cups of coffee dot the terrain. I recently discovered that I own two staplers.

Luckily, most of the information I need is on my hard disk, where I can find it with little or no trouble. Computerized information is inherently easy to search, but there's more to it than that: My computer—unlike my desk—is well organized. It's all a matter of keeping data files in logical locations, giving them easy-to-remember



JOHN CUNEO

names, backing up regularly, and generally thinking of my data as *my* data, not the property of whatever program I happened to create it in. This way I can easily find what I need, copy or archive everything connected with a single project, delete old files, and keep up-to-date backups of my precious data.

There isn't one right way to organize a hard disk, of course. Everyone has different work habits and goals. Corporate managers, freelance lawyers, and small business owners all need to tailor their disks differently, as do tailors (to say nothing of computer magazine editors). But there are a few simple rules that can make your life easier.

In the pages that follow, I'm going to show you how to organize your hard disk for speed, safety, and convenience. I'll tell you how to outsmart installation programs that think they know what's best for you, use the infamous eight-and-three file name limit to your advantage, and improve performance by keeping your AUTOEXEC .BAT's PATH statement short.

Everything in Its Place

Let's start with rule number one: Keep your data in one place, away from the programs you created it in. Save data files either in one directory branch (a directory and its subdirectories) or in a logical drive that you created when you partitioned your hard disk.

If you keep your data in the same directory as the program that created it, you're making life difficult for yourself—and asking for trouble. Think of how you would organize a filing cabinet: Would you put the typed papers in the first drawer, forms filled out in pencil in the second, stuff written with a pen (separated by ink color, of course) in the third, and fifth-generation carbon copies that are impossible to read at the bottom?

If you keep your data in the same directory as the program that created it, you're making life difficult for yourself–and asking for trouble.

Well, it's not a good way to organize your hard disk, either. A per-

To Partition or Not to Partition?

Should you *partition* your hard disk, causing DOS to see it as several smaller drives instead of one large one? When we asked this question on PC World Online, readers and editors on both sides of the issue responded passionately, unwilling even to consider the others' arguments. Here's a somewhat less zealous discussion of the advantages and disadvantages of partitioning your hard disk.

Partition Size Versus Cluster Size

Logical drive size	Cluster size
1–15MB	4K
16–127MB	2K
128–255MB	4K
256–512MB	8K

LARGE DRIVES MEAN WASTE: The size of your logical hard drive determines the size of your clusters. Smaller cluster sizes are more efficient.

If you partition your disk, you'll divide the space used by DOS into two parts: the *primary DOS partition,* which contains one *logical* (as opposed to physical) drive; and the *extended DOS partition,* which can contain several other logical drives. The primary partition drive gets the first available drive letter on your system, probably C:. You have 24 drive letters (C through Z) available for all the drives on your system, although you may need to reserve some of them for network drives.

Reclaiming Wasted Space

If you have a large hard disk, using more than one logical drive may be an excellent way to reduce the amount of "slack," or wasted, space. DOS reserves space for a file in units called *clusters* or *allocation units.* Every file takes up at least one cluster, and if a file is even 1 byte larger than the cluster size, it takes up two clusters, with most of the second cluster wasted. It's easy to see that smaller clusters mean less waste. For logical drives over 15MB, the larger the partition, the larger the cluster; in other words, partitioning your drive into smaller logical drives reduces slack. The figure at left shows a breakdown of these clusters.

To see how much space you're wasting, you can use the QBASIC program featured in "Reduce Your Waste" in January's *Dialog Box.* If you find you're wasting more than you are comfortable with (8MB to 10MB of wasted space is about normal for a 200MB hard disk), repartitioning may be a good idea.

Utility Advantages

Under certain circumstances, breaking up your hard drive can make backups more convenient. If your tape drive holds significantly less than your hard drive, so that you can't do a full backup on one tape, partitioning the drive will make make running partial backups easier. And if you prefer image backups—which save a byte-for-byte image of a logical drive to tape and are faster than file backups—the only way to back up your data while skipping your programs is to keep them on separate logical drives.

Partitioning may also give you better control over some utilities. For instance, if you want to exclude certain data from the SmartDrive disk cache, or turn off SmartDrive's write-back feature for a specific group of files, the only way to do it is to create a separate logical drive for each set of instructions.

Hitting the Too-Low Ceiling

So why doesn't everyone run out and partition his or her hard drive? Because dividing your disk divides your free space, and that limits your freedom. What happens if you need to install some monster application that requires great tracts of hard disk space? Or what if your collection of graphics files gets bigger? If you have 10MB free on

sonnel review is, first and foremost, a personnel review; the fact that it also happens to be a *WordPerfect* document is a mere detail. If you store your data as important information rather than an adjunct to applications, you'll be able to get to it faster and combine it easily with other types of files, and you'll be more likely to keep it secure.

Aside from being convenient and intuitive, segregating your data from your programs helps keep it safe. No one wants to back up an entire hard disk regularly, and backing up your data is much more important than backing up your programs, which you can always reinstall from the original floppies. Well, it's a lot easier to back up your data when it's all in one place—a simple XCOPY C:\DATA*.* A: /S /M will do it. And if you're recovering from a virus attack, you may want to restore only the data, a much easier job if it's backed up separately.

So Where Do You Put Your Data?

Should you keep your data on a separate disk partition? There's a lot of controversy about that, and Brett Glass offers the arguments for both sides in "To Partition or Not to Partition." For the purposes of this article, I'm going to assume that you won't, that you'll use a branch instead, and that the branch's parent directory will be called C:\DATA. Your actual data files could be kept in directories called C:\DATA\ CLIENTS, C:\DATA\ SMITH, C:\DATA \JAN, or, if you like to type a lot of backslashes, C:\DATA\ CLIENTS\SMITH\ JAN.

You don't have to call your parent directory C:\DATA, of course. I call mine C:\ARTICLES, which reflects what I do for a living. *PC World* senior editor Steve Fox came up with a directory name that is absolutely brilliant (he's my boss): C:\1_DATA, thus ensuring that it's always at the top of his root directory listing.

So if it's a good idea to put your data in directories inside C:\ DATA, is it a better idea to put it in directories inside directories of C:\DATA? Or directories inside directories inside directories? Well, yes and no. A deep directory structure, with several layers of directories, lets you break things down for better organization. You can easily access all your data concerning clients, concerning a particular

C:, 6MB on D:, and 11MB on E:, you can't put 15MB in a single directory, even though you have 27MB free.

Some people use partitions to organize files—storing data on one drive and applications on another, in the manner recommended in Lincoln Spector's article. But this can be done easily with directories, so it's no reason to partition. Some people would argue that drive letters are simpler to type than directory paths, thereby making partitioning worthwhile. But if you want to type D: instead of CD \DATA, you can achieve your goal with DOS's SUBST command, which lets you assign a drive letter to a directory, without the disadvantages (or for that matter the other advantages) of partitioning.

So What's Faster?

Does partitioning your hard drive affect performance? Since everyone in our Online discussion claimed that his or her scheme was the fastest, we asked the PC World Test Center to settle the matter. They ran their usual system performance tests on the same machine with four partitioning configurations. As you can see in the Test Center Report, there were no significant differences either way. Partitioning may at one time have improved speed, but the common acceptance of SmartDrive (which was used in the tests) and other disk caches probably leveled the playing field.

A Major Hassle

All the arguments that I've given, both pro and con, are worth considering if you have a new computer or hard disk to set up. But should you change your current configuration, creating multiple drives out of a large one (or vice versa)? Think hard before you answer, because repartitioning a hard disk takes substantial time and effort. As DOS's confusing FDISK program warns you, changing the size of an existing partition destroys the data on it. You'll need to back up everything on your old partition(s), run FDISK, format each of the logical drives that you've created, and restore your data, reorganizing it as you go along. This job is time-consuming, difficult, and for your data, downright dangerous.

When you're setting up a new system, however, the options are worth considering. Both choices have their advantages and disadvantages. It's difficult to go back, however, so make your decision carefully.

—Brett Glass

PC WORLD TEST CENTER REPORT

Time in seconds.	Excel 4.0	Word for Windows 2.0	Paradox 3.5 in DOS window
One partition – Everything on C:	357	387	480
Two partitions – DOS, Windows, applications on C:, data on D:	390	392	467
Three partitions – DOS, DOS apps, Windows/Temp on C:, Windows, Windows apps on D:, data on E:	350	385	487
Three partitions – DOS, DOS apps, Windows, Windows/Temp on C:, Windows apps on D:, data on E:	395	397	481

PARTITIONS AND SPEED: Our tests show that partitioning your hard disk will have no significant effect on your system's performance.

Data based on tests designed and conducted by the PC World Test Center. All rights reserved.

client, and concerning a particular client for a particular month. But typing C:\DATA\CLIENTS\SMITH\JAN\BILLING-.DOC can be something of a drag, and selecting your way through multiple directories in a *Windows* dialog box isn't a whole lot of fun either.

The bottom line: Experiment. If you find that typing *.* gives you more files than you want to deal with, break your data directories down into more subdirectories. But if you're getting tired of typing backslashes, consolidate some of your directories and bring your data closer to the root.

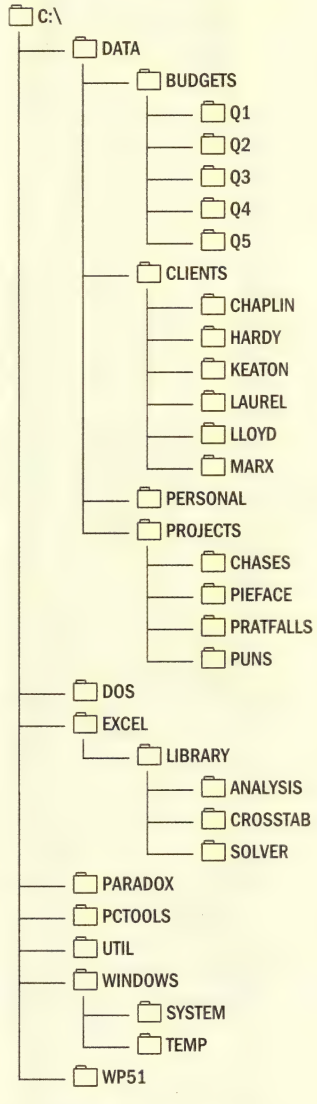
A File by Any Other Name

Ask people what they don't like about DOS, and the eight-dot-three file name limit is bound to come up. Let's face it: It's not easy to put a concept like "My Letter to Joe About the Cost Overruns" into eight concise letters.

Nevertheless, by inventing some codes and sticking to them, you can make this ridiculous system work. If you have several files concerning cost overruns, you might start all of their names with CO, so you can easily grab all of them with CO*.*. To show that the file is a letter, you could follow that with LT. You might use the next two letters to identify who the file is for: JO. That leaves you two spaces for a date, or maybe something like V1 to show that this is the *first* version of your letter to Joe about the cost overruns. And you still have the extension to identify the program you created it in. The name COLTJOV1.DOC may not look communicative, but if you use your system regularly, you'll instantly know what the name means (and you'll amaze your friends with your ability to find your files).

If your application doesn't insist on using the extension for its own purposes (most word processors and many other programs don't), you have three more characters to play with. You could, for instance, use LET, REP, and BIL for letters, reports, and bills. That makes it very easy to find all your bills with *.BIL.

A Well-Organized Hard Disk



By putting your data in subdirectories of a single directory, you can protect it better and group it by project instead of program.

The Path to a Short PATH

Okay, so you've got your nicely named files in a directory that's far away from your applications. How do you load that application if you're nowhere near it?

The traditional answer is to include the application directory in your AUTOEXEC.BAT file's PATH statement. That's because you can easily run any program whose directory is in your PATH, no matter what directory you're in. In fact, you probably already have all your programs' directories in your PATH; installation programs tend to put them there automatically.

But while this is convenient, it's also slow and wasteful. When you enter a command at the DOS prompt (we'll get to *Windows* in a moment), DOS first checks to see if it's an internal command (like DIR or CD). If it isn't, DOS looks for a COM, EXE, or BAT file in the current directory. If DOS can't find it there, it looks in the first directory in your PATH. If it's not there, DOS looks in the second, and so on. The longer the PATH, the longer you may wait. Also, the PATH statement resides in a very small piece of memory called the *environment*, and a large path will give you less room for the variables that DOS, batch files, and some applications like to store there.

There's another way to run an application from any directory: Use a simple batch file. For instance, here's how to load *WordPerfect* easily without putting C:\WP51 in your PATH. Instead, create a batch file called WP.BAT that contains the single line **@C:\WP51\WP**. The result is the same: Typing **WP** at the DOS prompt will launch the program without bouncing you out of your existing directory.

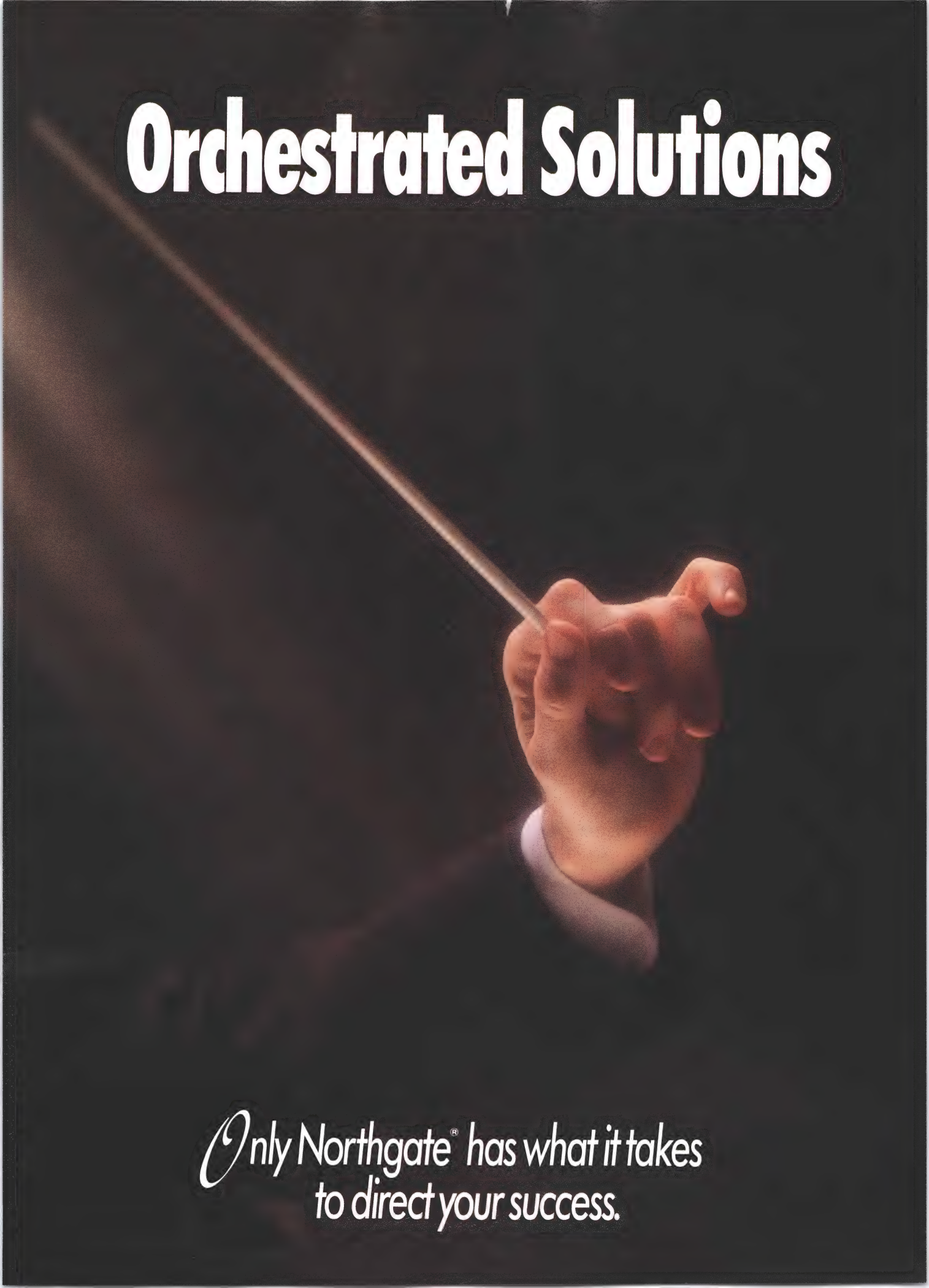
Of course, for this to work, WP.BAT must be in a directory on your PATH (you can't get away from it completely). So if you create one directory called C:\BAT and put batch files for all your applications in it, you can put that directory into your AUTOEXEC.BAT's PATH statement and remove a lot of other directories.

What other directories belong in your PATH? The rule is simple: If a directory contains more executable files than you want to bother making batch files for, put it in your PATH. This includes C:\DOS, so you can run FORMAT, XCOPY, EDIT, and those other little programs that come with the operating system. If you collect little utilities, gather them up and put them in one directory—I call mine C:\UTIL—and put that in the PATH as well. Utility collections such as *The Norton Utilities* and *PC Tools* belong in the PATH, because they contain multiple programs. And if you're on a network, chances are there'll be a network drive or two that must be included for reasons only Novell and your network administrator understand. So it's a rare computer indeed that needs a PATH statement longer than PATH C:\DOS; C:\BAT; C:\UTIL; C:\ PCTOOLS; Z:.

But what about your *Windows* directory? Doesn't that belong in your PATH? After all, there are a lot of little programs there.

(continues on page 155)

Orchestrated Solutions



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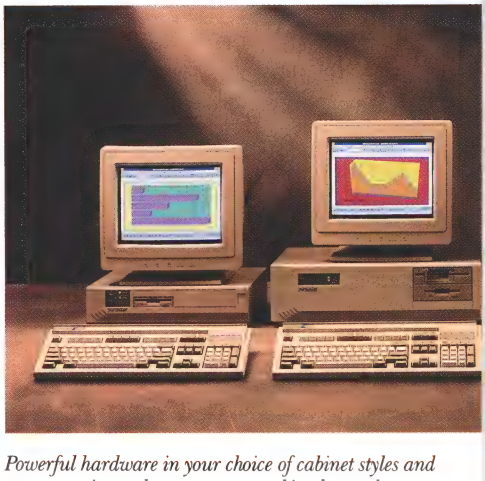

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(continued from page 148)

Well, C:\WINDOWS (or wherever you keep *Windows*) is different because *Windows* is different. There's only one program in C:\WINDOWS that you're likely to run from the DOS prompt, and that's WIN.COM, the program that launches *Windows*. You can load that with a one-line batch file like the example just noted. You'll run the other C:\WINDOWS programs, such as Notepad and Paintbrush, only from inside *Windows*, and *Windows* always acts as if its own directory is the first one in the PATH, whether or not \WINDOWS is actually in your PATH.

Windows applications are another matter. You can't launch them from batch files, and they don't reside in the *Windows* directory. Does that mean you *have* to put them in the PATH? Not necessarily. Chances are the only ways you're going to launch a *Windows* application are from its icon in Program Manager or by double-clicking an associated data file in File Manager. In either case, information that tells *Windows* where to find the program is probably already where *Windows* needs it.

When you install an application, whether for DOS or *Windows*, it will want to change AUTOEXEC.BAT's PATH statement. Don't let it. It will warn, it will plead, it will threaten. Be firm. With the exception of Aldus programs such as *PageMaker* and *IntelliDraw*, which keep their common support files in an ALDUS directory that must be on the PATH, I know of no application that had any trouble traceable to its not being in the PATH statement. If your application is an exception, you can always add it to the PATH later.

Making Data Your Default

Most applications assume that you are going to keep your data in the program directory, but very few insist on this arrangement. If you are going to keep your data in C:\DATA subdirectories, you might want all your applications to come up in C:\DATA. With very little work, you can make this happen.

Of course, there are always a few rotten applications in the barrel. Some programs don't care what you put in the Program Item Properties box—they have their own ideas where data should go.

With most DOS applications, the directory you're in when you load the program is where it will look for data. To make C:\DATA your default, simply replace your one-line batch file with:

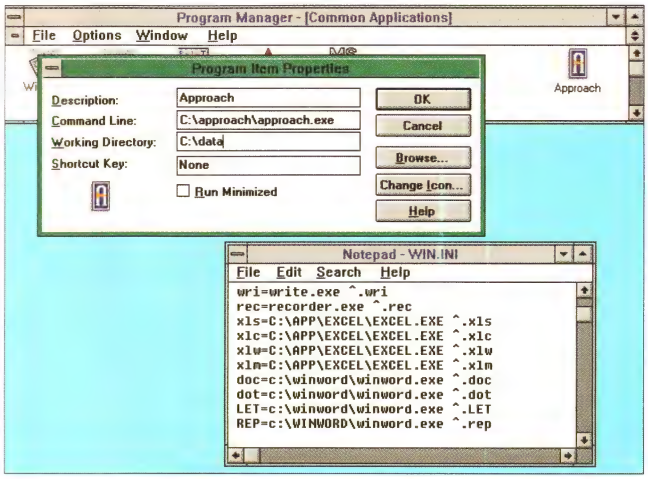
@C:

@CD\DATA

@PATH\PROGRAM

That is, if you have to. Several applications, including *WordPerfect* and *1-2-3*, let you set a default data directory. In *WordPerfect*, press **<Shift>-<F1>LD**, type **C:\DATA** or whatever your default data path is, and press **<Enter>** three times. In *1-2-3*, select */Worksheet•Global•Default•Directory*, enter **C:\DATA** or whatever, press **<Enter>**, and select *Update•Quit*.

And what about *Windows* programs? For once, *Windows* actually makes things easier. *Windows 3.1* does at any rate, at least with programs that behave themselves. To make a *Windows* application open up in your C:\DATA directory, highlight its icon in Program Manager and press **<Alt>-<Enter>**. This brings up the Program Item



NO PATH FOR WINDOWS APPLICATIONS: Both the Program Manager's Item Properties box and the [Extensions] section of WIN.INI tell Windows where to find a program.

Properties box, where one of the options is Working Directory. I think you can figure it out from there.

Of course, there are always a few rotten applications in the barrel. Some programs don't care what you put in the Program Item Properties box—they have their own ideas about where data should go. In most cases you can point them in the right direction with a WIN.INI command, but you'll probably have to call their technical support department to find out more about it. I had to do that with Micrografx's *Windows Draw*, which insisted on coming up in its own SAMPLE directory. The solution? Putting the command DRAWINGS= C:\ARTICLES in the [Windows Draw 3.0] section of my WIN.INI file.

If you launch a program by double-clicking a data file in File Manager, you don't have to care about the default working directory. But you may have to worry about file extensions, at least if you use extensions of your own devising. The solution lies in WIN.INI. For instance, if you create reports in *Excel*, and you mark them with an REP extension rather than the default XLS, load WIN.INI into Notepad (you can do this from Program Manager or File Manager by selecting *File•Run* and typing **WIN.INI**), find the section labeled '[Extensions]', and add the line **REP=C:\EXCEL\ EXCEL.EXE ^.REP**.

Beyond Directories

The DOS directory system is a useful tool, letting you organize your programs and work in the logical manner of your choice. But what if you want to track files by clients *and* by quarters? You can't put DEC_ SMITH.WK1 in both your C:\DATA\Q4 and your C:\DATA\ SMITH directories. (You can put copies of a file in multiple directories, but that wastes disk space and causes revision problems.)

That's where virtual directories come in handy. A virtual directory (my term—you'll probably never see it outside this article) is a list of files, all matching a set of criteria, that you can treat like a directory. It's not an absolute necessity, but being able to pull up, launch from, or copy all your fourth quarter files—even if they're spread

across several directories—is a great convenience.

To create virtual directories, you need a DOS shell or file manager that can search for files across multiple directories, then display the files it finds in something that looks like a directory listing. You'll want the ability to browse that listing, select files, copy, move, or delete files, and do just about anything the file manager will let you do with a regular directory listing. In our last buyers' guide to DOS Shells (September 1992), 17 out of 33 shells had this capability.

Of course, doing it and doing it well don't always go hand in hand. Both the DOS 5.0 DOSSHELL and the *Windows 3.1* File Manager can treat search results like a directory, but you're limited to searching by file name and directory tree. In other words, you can make a "directory" out of all the DEC*.* files in C:\DATA and its subdirectories, but if you want all the *recent* files, or those with a particular word in them, you'll have to spend some money.

No other program offers more or better choices than Lotus's *Magellan,* the most powerful file manager ever made. Its first-rate file-searching tool—it even does fuzzy searches—produces a list you can manipulate any way you want. You can save sets of search criteria by name, so that bringing up "Denise's Work in 1992" will always bring up, well, Denise's work from 1992. And when you copy files from a virtual directory, you even have the option to copy their directory structures with them, so that, for example, copies of the files that are actually in C:\DATA\CLIENTS end up in A:\DATA\CLIENTS. Unfortunately, *Magellan* has a complex, nonstandard interface and hasn't been updated in nearly three years. Other file managers that come close to matching *Magellan*'s power include *File Director, 1DIR+, XTree Gold,* and both DOS and *Windows* versions of *Norton Desktop* and *PC Tools.* A discussion of some of my favorite file organization utilities—not all of which offer virtual directories—appears at the end of this article.

What other directories belong in your PATH? The rule is simple: If a directory contains more executable files than you want to bother making batch files for, put it in your PATH.

So Why Wait?

Keeping an organized hard disk isn't difficult; it's really just a matter of being consistent and dividing up your work logically. True, it may take an hour or two to move the files and tell your applications about it, but you'll only have to do that once. Then you'll reap the benefits of quicker searches, easier navigation, and backups so simple you might even perform them daily.

Next, I'll show you how to keep an organized set of floppy disks. I've got one of those here somewhere . . . maybe it's under that pile.

Lincoln Spector is an associate editor and Brett Glass and George Campbell are contributing editors for PC World.

Counterpoint: An Alternate Organization Strategy

While the organization strategy outlined in Lincoln Spector's article makes good sense for many users, others may find it less than perfect. If your data falls into many categories rather than just the few laid out in the main article, or if your projects often use multiple files created by several applications, you may find yourself bogged down by storing data files separately from the applications which created them.

Here's an example: Suppose that one of your regular projects is an internal sales report. The main report might be created in *Word for Windows* but will contain, say, a graphic logo file and a chart from *Excel* and use a *dBASE* data file to print mail-merged copies for distribution. Most of these files are not unique to the report itself but are reused in other documents.

If you store these accessory files separate from the programs that created them, you can easily lose track of their location or, worse yet, end up with multiple copies of the files wasting your precious hard disk space.

Most of us use just a few programs regularly and have no problem keeping track of where they're located. If you store data files in directories under their program's directory, you'll always know where files created by *dBASE, Excel,* or *Word for Windows* can be found.

Even if you need multiple subdirectories for different kinds of documents, it's easier to create them under the program directory.

As Lincoln pointed out, most programs install themselves with prebuilt data directories for their files. When you open a data file in those programs, the program automatically looks for its data files in the appropriate directory. Although you can change that default directory in most cases, why bother? A little creative file naming, as described in the main article, makes finding your files a breeze. And if you tend to update files from one application more often than you do files from another one (for instance, I write and edit word processing files all the time and rarely change my bit maps), backing up only a single program's data files can be a big time-saver.

Even if you need multiple subdirectories for different kinds of documents, such as letters, reports, and memos, it's easier to create them *under* the main program directory. That way, you don't have to change defaults and write batch files to have your data directories just a few keystrokes or mouse clicks away when you open an application.

You won't need any fancy tricks, virtual directories, or shell programs to find files under this system, either. Since you're using the program's own default filing system, files will be just where both you and the program expect them to be.

—George Campbell

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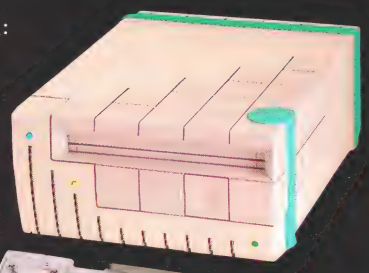

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LINCOLN'S FAVORITE FILE

You can do plenty with the DOS prompt, DOSSHELL, and the *Windows* File Manager. But if you're willing to spend a few dollars, you can do even more. Here are a few of my favorite tools for finding the files I need, putting them in usable groups, looking at what's inside them, and shrinking them down into something that will take up less precious hard disk space.

A disclaimer: I have not used every utility program ever made, but I have looked at a great many of them. There are a lot of very good, even great, programs out there that can do many of the same things as the ones I've listed. So if *your* favorite program isn't included, it's not my fault!

For the DOS Prompt

Go

✔SHAREWARE Ever need to delete BAK files across your entire drive? Or find a text string somewhere in a directory branch? This public domain program by Garry J. Vass runs other programs or commands across multiple directories. For instance, if you enter the command GO DEL *.BAK, *GO* will run DEL *.BAK in the current directory and every directory below it. Mr. Vass has left us no address or phone number, but GO.ZIP is available on PC World Online and other on-line services. No registration fee.

HandyDOS 1.6

✔SHAREWARE *Handy-DOS* is an incredibly cool collection of command-line and batch file utilities. Along with programs that help you move files, erase directories, and delete BAK files across a directory branch or disk, there's a program for changing file attributes that's considerably easier to use than DOS's ATTRIB. Best of all is a little program called D, which lets you define 100 quick access shortcuts; for instance, you can have the command 'D 12' bring your \DATA\CLIENTS\JONES directory, while 'D 13' will go to \DATA\ PROJECTS, start *WordPerfect*, and load a commonly used file. *HandyDOS* is available as HDOS16.ZIP on PC World Online and other On-line services. Abri Technologies, 304/947-7129. Registration: $25. **Reader service no. 817**

PKZIP 1.1 (and possibly 2.0)

✔SHAREWARE Few shareware programs become standards, but *PKZIP* has. Through one command at the DOS prompt, you can compress a file or many files, save the directory structure with the files, add files to an existing archive, and password protect the lot. You can then turn your compressed ZIP file into a self-extracting program. The ZIP 1.*x* file format is a true standard; six other programs in these listings support it. As I write, version 2.0 with a new file format is expected; what it will do to the standard ZIP file remains to be seen. *PKZIP* is available as PKZ110.EXE on PC World Online and other on-line services. PKWare, 414/354-8699, 414/354-8559 (fax). Registration: $47. **Reader service no. 818**

Zip Chunker 1.02

✔SHAREWARE Sometimes, ZIPping a large directory isn't enough. Until I found *Zip Chunker*, vast stretches of my hard disk were occupied by huge ZIP files that I couldn't evict because I needed them, and they didn't fit on a floppy. *Zip Chunker* solved this problem by turning each of these enormous ZIP files into several merely big ZIP files, which I could then copy onto a series of floppy disks. Simple and quick, *Zip Chunker* is available as ZC102.ZIP on PC World Online and other on-line services. Scott Jibben, 612/561-3866, 612/566-0758 (fax). Registration: $10. **Reader service no. 819**

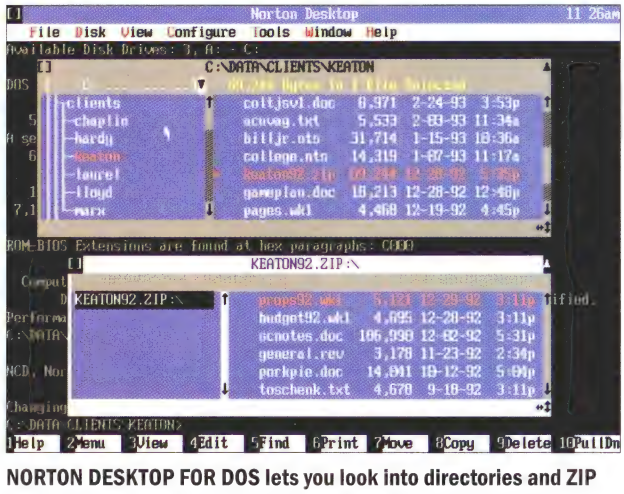
DOS Shells: Replacing the Interface

Magellan 2.0

Yes, I'm recommending an orphan—a program that is still being sold and supported but is otherwise considered dead by the company that makes it. So don't expect an upgrade anytime soon—or ever. Still, *Magellan* is simply the most powerful file management tool ever created. You can pull up a list of files by any criteria you can think of, save criteria by name, zip and unzip files and directories, and view files in a variety of formats—although the format selection is getting old. The *Magellan* interface was clunky in its time and is hopelessly out-of-date now, but once you learn it, nothing else lets you grab what you need as quickly and easily. Lotus Development, 800/343-5414, 617/577-8500. List price: $99. **Reader service no. 820**

Norton Desktop for DOS

Want something that's almost as powerful as *Magellan*, has a modern GUI-style interface, and comes from a company that still loves it? Aside from everything else it has (virus protection, hex editor, *PC World* Best Buy–winning backup program, defragger, and more), *Norton Desktop for DOS* has a great set of file management tools. The file manager (the heart of the program) gives you multiple directory windows, views files in a variety of formats, treats ZIP files



NORTON DESKTOP FOR DOS lets you look into directories and ZIP files. Note the DOS prompt behind the windows.

ORGANIZATION TOOLS

like directories that you can copy to and from (unfortunately, you can't view a file inside a ZIP file), and offers a file finder that puts its results into a directory-style window. In addition, you can keep the DOS prompt, which can be on screen at all times, and the program also comes with a great selection of DOS prompt programs and enhancements. Symantec, 800/441-7234, 408/ 252-4694 (fax). List price: $179. **Reader service no. 821**

Tree86 4.0

Tree86 is a modest DOS shell, without *Magellan*'s incredible capabilities or *Norton*'s everything-in-one-box ambition. In fact, *Tree86* fits on one low-density floppy—when was the last time you saw a DOS shell do that? And it can still search for files by name across your drive, then sort or tag them by attribute, date, or contents. And the interface is easy and just plain pleasant to use. Aldridge Co., 713/953-1940, 713/953-0806 (fax). List price: $89.95. **Reader service no. 822**

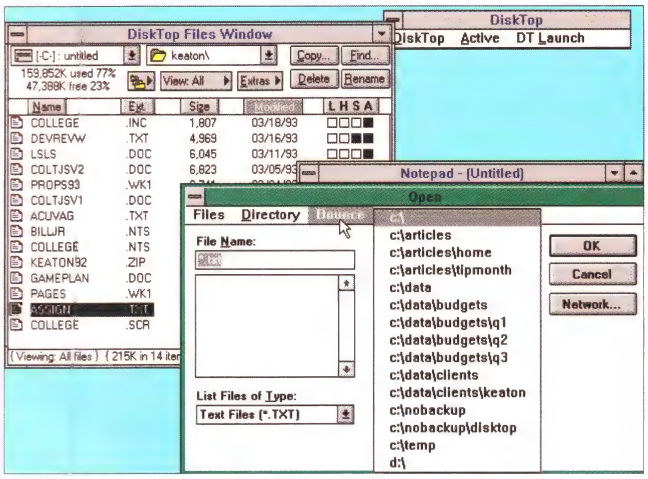
Enhancing the Windows File Manager

Drag and Zip

WINDOWS ✓SHAREWARE *PKZIP*'s command-line interface doesn't lend itself to *Windows*, but with *Drag and Zip*, it does not have to. Simply drag a file, or a group of files, from File Manager to the zipper icon, and *Drag and Zip* will run *PKZIP* in a DOS box, feeding it the necessary parameters. A bundled program lets you view the contents of a ZIP file and then return files within it to their original state. *Drag and Zip* is available on PC World Online and other on-line services as DRAGZP.ZIP. Canyon Software, 415/453-9779, 415/459-4904. Registration: $20. **Reader service no. 823**

Outside In 2.0

WINDOWS *Outside In* is, quite simply, the best file management tool *Windows* users can buy. Without giving up the basic File Manager, you can view, examine, search, print, and copy to the Clipboard from almost any file on your hard disk without loading the application it was created in. *Outside In* lets you view files through File Manager, *Norton Desktop* (it replaces that program's inferior file viewers), any file manager that supports *Windows 3.1*'s drag and drop, and several popular E-mail programs. You can also view files through *Outside In*'s own very advanced file-finding interface. The program supports 120 file formats, including all major word processing, spreadsheet, database, and graphics standards, plus *PKZIP*. For more details, see *New Products*. Systems Compatibility Corp., 800/333-1395, 312/329-0700, 312/670-0820 (fax). List price: $89. **Reader service no. 824**



DISKTOP'S WINDOWS: DiskTop's file-finding tools extend to Notepad's standard File Open dialog. Note how small the standard DiskTop window is (upper right).

Windows File Manager Replacements

DiskTop for Windows

WINDOWS Small, slick, and undemanding, *DiskTop* gives you a lot of convenience for a little RAM, hard disk space, and screen real estate. The file manager (*DiskTop* also has program and task management tools) is very easy to use, with a pop-up list that lets you "bounce" to any of the last 22 directories you've visited. Coolest of all, *DiskTop* can hook into any program that uses *Windows*' common dialog boxes and give these boxes all sorts of tools they never had, including the capability to sort files, create directories, reload recently used files, and use the bounce feature just described. These hooks are inserted without altering your standard configuration (in that regard, *DiskTop* is the politest *Windows* utility I've seen). One caveat: The program launcher doesn't recognize working directories; it's a hassle to keep programs and data separate. CE Software, 515/224-1995, 515/244-4534 (fax). List price: $79.95. **Reader service no. 825**

Norton Desktop for Windows 2.0

WINDOWS This all-in-one collection has some great file management tools. You'll find file viewers, a file-searching tool that puts its results in a directorylike window, and drag-and-drop capabilities that far surpass *Windows*' own tools, letting you drag a file onto an *unlaunched* program, launching and loading at the same time. Finding the exact directory or file you want is a breeze: Just start typing the name, and *NDW* will find it—and I'm not just talking about the first letter, either. What it lacks—and what *Norton Desktop for DOS* has—is ZIP file support. The collection includes disk utilities, a backup program, virus protection, an icon editor, and all sorts of neat stuff that doesn't necessarily fit in the file management category. Symantec, 800/441-7234, 408/253-9600, 408/255-3344 (fax). List price: $179. **Reader service no. 826**

For more information about all products in this sidebar, circle reader service no. 907.

The *Evolution* Of P

1984
The Luggables
- 35 pounds
- 8088-class CPU
- 512K RAM
- Floppy drive
- No hard drive
- AC only
- Monochrome display

$4000 to $5000

1987
The Laptops
- 15 to 20 pounds
- 8088 or 80286-class CPU
- 640K RAM
- Floppy drive
- 10 or 20MB hard drive
- AC only or 1.5-hour battery
- CGA display

$3500 to $4500

You've been wrestling with over-sized, over-priced portables for nine long years! Now Gateway 2000 emerges from the struggle and introduces the missing link in the evolution of portable computing. It's the HandBook, a perfect combination of portability and functionality for all on-the-go Homo Sapiens.

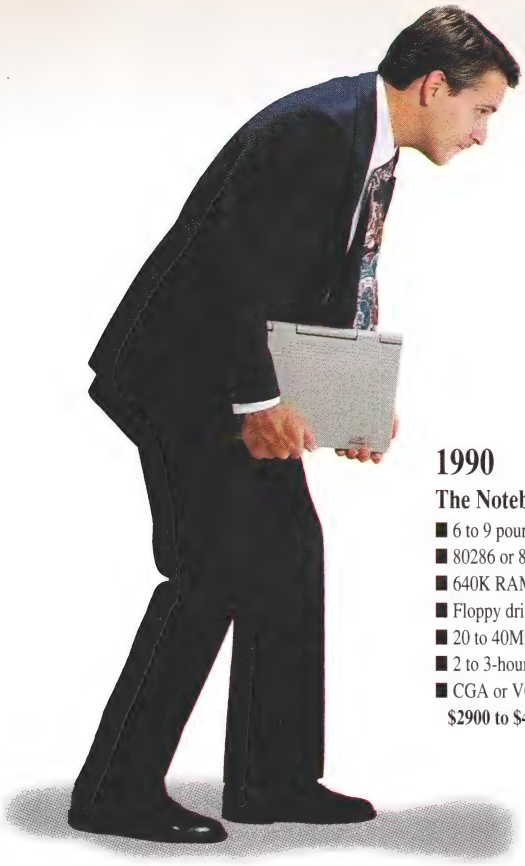
The HandBook is a real PC in a revolutionary new form. Not a notebook, not a palmtop, the HandBook is the first fully-functional PC in a truly portable, handbook-sized form. You can easily take the HandBook anywhere because this new species measures a mere 6 x 10 inches and weighs only 2.75 pounds, yet it runs over 5,000 of your favorite DOS applications. You aren't stuck buying and learning proprietary "card" programs when you have a HandBook.

The exclusive auto-resume feature enables the HandBook to work like no other PC you've ever seen. Auto-resume allows you to suspend the computer's operation for moments or weeks at a time, and then return to your work right where you left off – in seconds, and at the touch of a button.

With the HandBook you get 40MB of hard disk capacity to easily and quickly store all your DOS programs and files.

The quiet and comfortable touch-type keyboard allows you

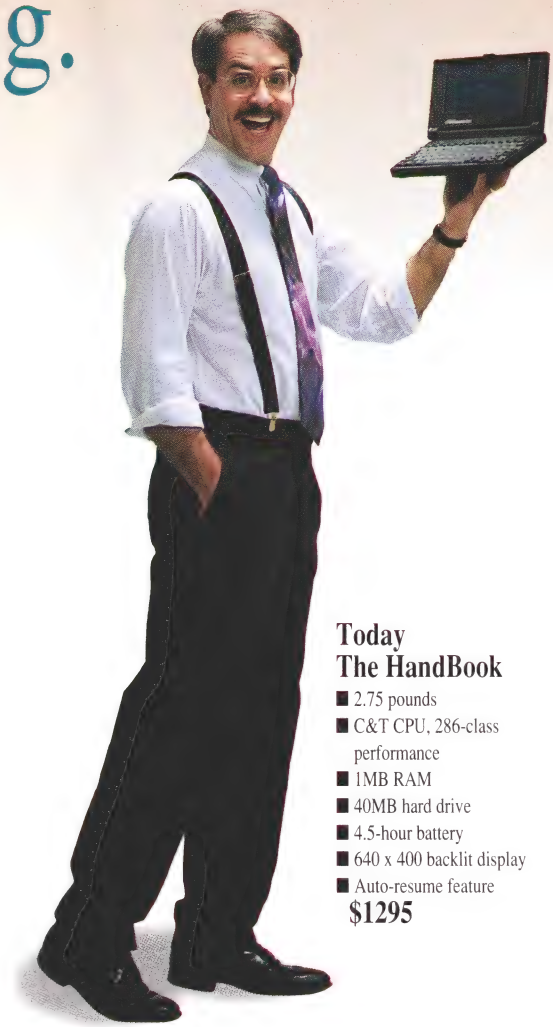
ortable Computing.



1990
The Notebooks

- 6 to 9 pounds
- 80286 or 80386SX-class CPU
- 640K RAM
- Floppy drive
- 20 to 40MB hard drive
- 2 to 3-hour battery
- CGA or VGA display

$2900 to $4500



Today
The HandBook

- 2.75 pounds
- C&T CPU, 286-class performance
- 1MB RAM
- 40MB hard drive
- 4.5-hour battery
- 640 x 400 backlit display
- Auto-resume feature

$1295

to type as fast as you can on your desktop keyboard.

The HandBook's 640 x 400 resolution backlit screen can be read in virtually any light and is large enough to display full 80-column lines of text, so you can use the HandBook whenever and wherever you need to. And the HandBook gives you all this with up to 4.5 hours of life on a replaceable battery.

The Gateway HandBook was designed specifically for you – today's on-the-move computer user. Once you get your hands on a HandBook, you'll struggle no more with a Neanderthal artifact

The HandBook was named one of the year's "Best of What's New" products by Popular Science *magazine and received* BYTE *magazine's Award of Distinction.*

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1. Compatibility With HP LaserJet® emulation and Adobe® PostScript® software, microLaser easily supports your demanding applications. And with our Microsoft Windows driver, set it and forget it with all Windows applications.

Not only does PostScript give you scalable outline fonts and graphics, it also means that your microLaser works in computing environments like Windows, DOS®, Apple® Macintosh®, OS/2® and UNIX®.

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POSTSCRIPT® Software From Adobe

3. Reliability When you buy a printer, you want it to print. And print. And print. That's just what the microLaser does.

Take our personal microLaser Plus for example. With its high duty cycle of 10,000 pages-per-month* and a standard one-year limited warranty**, you can rely on your microLaser to work the first time, every time, for years.

4. Value Starting as low as $999†, there's a microLaser designed to fit any budget. From the single user all the way up to a network. Consider this, too: microLaser's average cost per page is only 1.9 cents‡, while some laser printers average around 3.3 cents. The microLaser not only makes sense, it saves you money, too.

For details on the right microLaser for you and the name of the nearest dealer, call

1-800-527-3500.

The microLaser PS17 has earned the 1990 *PC World* Best Buy award; microLaser PS35 has earned the 1990 *InfoWorld* Excellent Value award and 4½ mice from *MacUser*, October 1990.

Features	microLaser Plus Basic	microLaser Plus PS17/PS35	microLaser Turbo	microLaser XL Turbo
PPM	9 ppm	9 ppm	9 ppm	16 ppm
Emulation	HP LaserJet II	HPLJII/PostScript	HPLJII/PostScript II	HPLJII/PostScript II
Processor	68000	68000	RISC/8220	RISC/8220
Fonts	14 HP Fonts	17 or 35 Scalable	35 Scalable	35 Scalable
List Price	$999	$1,399/$1,499	$1,749	$3,649

TEXAS INSTRUMENTS

*Based on estimated typical usage. **For more information on service upgrade options, call 1-800-847-5757 in the U.S. and 1-800-268-6314 in Canada. †Suggested retail price – dealer prices may vary. ‡Based on suggested retail price of consumables and approximate page coverage rating for each consumable at 4% black (toner, developer and OPC). microLaser is a trademark of Texas Instruments Incorporated. Microsoft and DOS are registered trademarks, and Windows is a trademark of Microsoft Corporation. Adobe, PostScript and the PostScript logo are registered trademarks of Adobe Systems Incorporated which may be registered in certain jurisdictions. LaserJet is a registered trademark of Hewlett-Packard, Inc. Apple and Macintosh are registered trademarks of Apple Computer, Inc. OS/2 is a registered trademark of International Business Machines Corporation. UNIX is a registered trademark of AT&T. ©1992 TI 76543

Circle 242 on reader service card

DEEP in the Art of TAXES

Tax software can help the average taxpayer save a few bucks, but does it measure up to a tax accountant? A mixed bag of seven personal tax programs take on the IRS—and H&R Block.

ROBERT ZIMMERMAN

Between the humble lifestyle of the 1040EZ and the dizzying complexity of self-employment Schedule C lie the moderate complications of the average tax return. If your tax situation is slightly knotty, but not quite gnarled, a personal tax package can help you save the cost of a human tax preparer—and may teach you some tantalizing tax tips.

A good personal tax package can deal competently with wages (or straightforward unearned income, such as unemployment compensation, pensions, and alimony) and with deductions for child care, charitable contributions, standard mileage, state and local income and property taxes, and home mortgage interest—even if they're all on one return. Should your situation include some of the gray areas of the tax laws (such as oil and gas investments or passive activities), you can still use a program to draft a return for your accountant to check. And if you've been tracking your finances with a

By Naomi Wise with Richard Melville

financial management program, software that imports data directly to your return may work wonders for you.

We looked at every program under $100 we could find that's designed primarily to help individuals prepare their own tax returns. We hoped to learn which were most likely to save you money, and which, if any, might catch you in a tax tornado. We asked an accountant from the firm of Peckler, Evans and Kolling to create a moderately complex test case for us based on the financial situation of a typical *PC World* reader's family (see "Our Tax Scenario"). Then our expert audited the returns generated by seven tax programs and by a local branch of H&R Block. The results of the audit and a look at how the programs compared to H&R Block are presented in "Tax Programs Versus H&R Block: The Self-Employment Difference."

With each program, we tested the "early bird" or "head start" edition—a version of the software issued in autumn for those who prefer tax returns to gift returns during the holiday season. (The final versions are sent free between January and March to registered "early bird" owners.) The preliminary packages can't generate legal returns, and their programming isn't always complete, either. And since we weren't testing the final versions, we can't draw absolute conclusions or choose a Best Buy. What we can and did find out, though, is how the programs run, how easy they are to use, and how they handle specific tax areas.

Our Tax Scenario

In our scenario, prepared by the firm of Peckler, Evans and Kolling, Kevin Smith, an office manager, received $57,000 in gross wages and had $9546 withheld for federal tax and $2160 for state tax. His wife, Kristal Jones, is an independent computer consultant who grossed $16,400, and made three estimated payments of $500 each for federal tax and $75 each for state tax. Their four-year-old, Kyle, spends his days at a local child care center charging $3200 per year.

The family received a taxable refund of $100 from the state and bank account interest of $640. They sold 100 shares of stock on September 9, 1991 for $3000. They bought the stock on January 10, 1987 for $1400.

Their mortgage interest was $9600 and property taxes were $1100. The deductible portions of their car registration fees were $74 for Kevin's car and $220 for Kristal's car. They contributed $1100 cash to charities along with a noncash contribution of clothes, books, and toys purchased December 1, 1988 for $1850; their estimated resale value is $600.

Kevin's auto expenses, not reimbursed by his employer, included 2300 business miles (out of 27,000 total miles) in a car he purchased July 1, 1989. He paid $85 in tolls and parking costs on business trips, spent $200 to entertain clients, and laid out $150 for unreimbursed travel costs.

Self-Employment Expenses

On February 1, 1991 Kristal bought a new IBM PC desktop system for work for $3600, and has decided to depreciate it over five years. She bought software on the same date: One program cost $339, and another $150. She also spent $150 for office supplies, $70 for bank charges, $200 for business insurance, $500 for computer-related supplies, $300 for repairs and maintenance, and $500 in legal fees. She spent $500 entertaining clients, $600 for travel, and $300 for advertising.

Kristal bought a new car on January 1, 1991 for $15,000. She drove 12,000 business miles out of 20,000 total miles. Her gas, insurance, and repairs came to $2000. She paid $2400 in car-loan interest.

Kristal wants to contribute the maximum to her SEP-IRA. Kristal's office is at home. The home's total area is 1900 square feet, and Kristal's home office is 228 square feet. General repair and maintenance costs were $700. Utilities for the entire home cost $810 for the year (obviously nobody left lights burning) and homeowners' insurance was $500. The home cost $85,000, with the house valued at $55,000 and the land at $30,000.

The Interactive Approach

The classic approach to preparing taxes on a computer emphasizes speed, not comfort: It goes straight to the tax forms, with text-based help reminiscent of a tax booklet. Classic programs are actually scaled-down scions of higher-priced, more comprehensive programs for tax professionals, and they may require knowledge of financial language, laws, and practices.

Interactive programs, on the other hand, gather information mainly through an on-screen interview and offer tax help (of widely varying degrees of usefulness) as you go. This technique is one of the reasons tax preparation software has become popular—such hand-holding is a sheer necessity for those of us who can't waltz across taxes without a partner to lead us.

The interview sessions are designed to usher even brain-deficient scarecrows and frightened financial lions gently down the yellow roads of taxes. (Weathered tax wizards can use them too, of course.) As you answer questions, the program determines which forms you need to complete, and may stick around to coach you. The user guides are unusually friendly, with clear and sometimes witty language and legible layouts.

All the interactive programs can import from *1-2-3, Dollars and Sense, Managing Your Money,* and *Quicken.* (*TaxCut* can even import last year's return from rival *TurboTax.*) These packages also offer a "shoe box"—an alphabetical list of tax topics that finds homes for orphaned items. (Some users prefer to fling their raw figures into the shoe box even before they start the interview.)

Don't assume, however, that an interactive program will help you remember every single item. Many incidental deductions (such as union dues, investment fees, car registration fees) may only be mentioned in pop-up tax hints tied to the space where you can enter them. Just keep hitting the Help key if you want to get your money's worth.

What to Look for in a Tax Package

When you buy a personal tax program, you should get a lot more than just a tax deduction for its cost and the chance to use the

Delete key instead of an eraser. The programs not only perform most calculations, but by linking related forms, they transfer calculated fields from supporting worksheets to schedules and from schedules to the 1040. (Calculations may be performed constantly as you enter new data or only upon command, or they may be generated by your spreadsheet program.) And once you've bought a tax package, you'll be able to purchase subsequent editions at a discount of about 50 percent. With that, you'll be able to import the previous year's data for savings in input time and improved tracking of those elusive carried-over deductions.

Tax Assistance

Want more for your money? You may get it. With most tax programs, you'll rarely have to crack the manual, since pulldown menus will guide you through the protocols. Among the most important options for the inexperienced tax preparer is an on-line audit function. This option alerts you to any glaring inconsistencies or omissions, and it may even compare your deductions to U.S. averages (because the IRS sure will).

Some other features that you'll want to be on the lookout for, but that are more commonly found only in the interactive programs, include an automatic final audit and a demonstration of how the program arrived at its calculations. Other typical features include summaries of tax law changes, tax tips based on your entries, hotkey access to DOS, electronic memo pads, scratch pads, and checklists that prompt you to enter stray financial scraps, and periodic reminders to save your file. You may also find a pop-up calculator and a pulldown scratch pad you can use to total groups of miscellaneous loose receipts.

Preparation and Filing

If the program makes calculations automatically, look for a calculation override option for fields where you know something that the program doesn't. A number of packages also offer what-if analyses to estimate what your taxes might be if you switched from a joint return to a pair of single ones, or even if you moved to Maui and bought a new Mustang to work as a rural mail carrier. (Such speculations appear on clearly labeled alternative forms, so you can't confuse them with real life.)

If you can buy an add-on module for your state taxes, you won't have to go through the tedium of entering all the same data twice.

If you're eligible for a refund, filing your return electronically through a transmitting service will get you a check in three weeks or less.

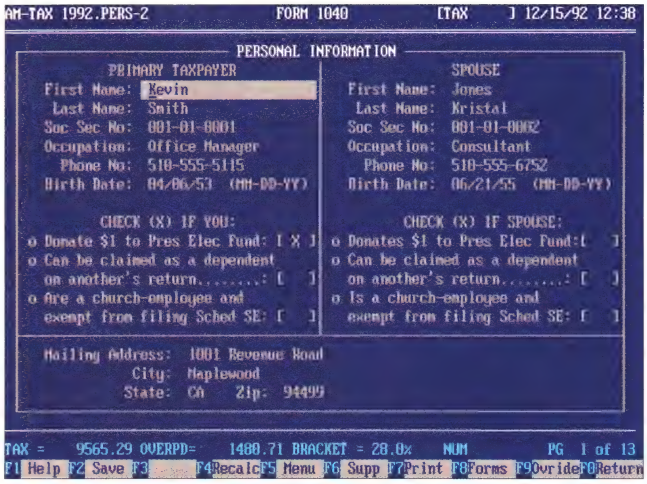
Although you can't substitute your printouts for the official state forms, the software companies sell plastic overlays to produce a legal photocopied state return. And if you've laboriously recorded your ongoing finances with a money management program, your drudgery will finally be rewarded when you use an import-capable program (*Andrew Tobias' TaxCut, EasyTax, Personal Tax Edge, Tax Solver,* and *TurboTax*) that zaps your figures right into your return.

If you're eligible for a refund, filing your return electronically through a transmitting service will get you a check in three weeks or less. The IRS prefers electronically filed returns because they reduce the time, cost, and error risk of manual data entry. Those companies offering electronic filing with their personal tax packages charge less than $25 for the transmittal.

Tax Tech Support

No matter how chummy the software, the fun stops around the 15-minute mark. In exchange for saving a tax preparer's fee, you'll expend hours or days of gruelling labor. Our test results brutally informed us that haste makes waste of deductions and hash of adjustments. Unless you're an expert, you should choose a program offering lavish tax help and peruse every hint you can get.

Should you need live program help at the height of the tax season, you're liable to spend additional time on hold listening to Vivaldi until the next available technician takes your call in the order in which it was received.



AM-TAX'S EASY-TO-READ input screens include a "bottom line" summary of your tax return displayed across the bottom of the screen.

AM-Tax

AM-Tax is a classic program that runs rapidly along its narrow-gauge rail. Its screen format is austere and its on-line help offers only program instructions. Overall recalculation is performed on command, and you can switch between forms with a keystroke. A bottom line just above the menu shows how much you owe so far.

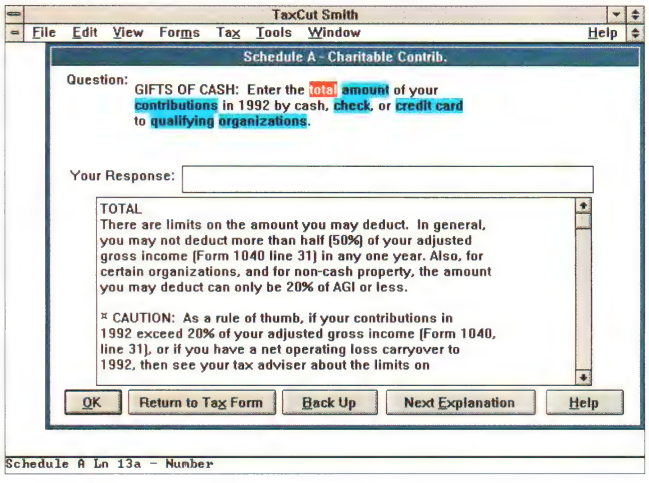
You start with the 1040. To verify which additional forms to use and how to complete them, you go to the forms appendix in *AM-Tax*'s 1040 manual (a user guide written in typical software-docs prose).

The head-start version had a few apparent bugs. It inserted two irrelevant forms and wouldn't delete them. It also erased the amount of federal tax withheld at every recalculation; we finally had to commingle the wife's estimated tax payments with her husband's withholding. (The IRS would return this return for correction.) No final audit option is included.

AM-Tax's personal-use program is available as Personal 1 with 37 IRS forms ($40, or $45 with early-bird module), and Personal 2 including 60 forms ($65, or $70 with early-bird). State modules are available for 22 states. Electronic filing is available only with the higher-priced Professional packages.

AM-Tax, AM Software; 816/741-7848

Reader service no. 670



ONCE YOU FINISH TAXCUT'S interview, you get to double-check its selection of tax forms so you won't miss a key deduction.

Andrew Tobias' TaxCut

WINDOWS Created by the same company as *Andrew Tobias' Managing Your Money*, *Andrew Tobias' TaxCut* is nearly jovial enough to make this woeful work entertaining. Each chapter in its readable user guide opens with a bon mot. (To wit: "There is one difference between a tax collector and a taxidermist—a taxidermist leaves the hide.") The same attitude manifests itself on screen.

As you navigate through a full-length interview, *TaxCut* fills out your forms, displaying a wealth of helpful hints pertinent to each of the questions.

You always know where you are, and you can switch at will between the interview and the forms. Although there's a pop-up calculator, the program calculates virtually everything automatically, including the items you total on a scratch pad. Early starters can even flag estimated figures while waiting for that laggard W2.

When it comes to the self-employment forms, *TaxCut* admits on screen that it can't encompass every nuance. It did better than the rest, though, due to its lucid explanation of depreciation terms and its up-front confessions of its inadequacies.

The line-by-line audit is properly picky, and should you faintly recollect some audit-evading goof, you can reach it through Find Form By Tax Topic.

TaxCut supports a whopping 85 forms and schedules, with modules for 23 states. Data can be exchanged between the Macintosh edition and the DOS and *Windows* editions.

Andrew Tobias' TaxCut, Meca Software; 800/288-6322

Reader service no. 671

EasyTax

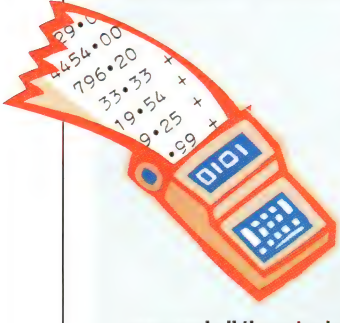
With *EasyTax* you get a colorful screen bedecked with menus above and below. Oddly, you need to hit the space bar for many entries, but on-screen protocol hints (e.g., "use space bar") tell you what to do.

A brief, brusque interview merely determines which forms you'll need to complete, then leaves you with miles and miles of taxes still ahead. The pertinent forms on the Forms List are marked with asterisks. Once you've opened a form, its name appears in boldface. It's easy to falsely assume later that this means you've completed it. In fact, you need to recheck all forms for completion.

You'll need the pop-up calculator often, because *EasyTax* won't perform several calculations that other programs handle automatically, such as percentage business use of certain assets.

Pop-up options include helpful hints (inadequate for a tax novice), some general tax tips tied to the forms rather than your entries, and hypertext help, offering mind-boggling IRS-authored instructions for selected spaces. The shoe box is shallow (lacking,

Tax Programs Versus H&R Block: The Self-Employment Difference



All our programs (and, of course, H&R Block) got the basics of the return right, adding up their numbers and applying the right percentages. They can all be trusted to handle straightforward wages, state and local income and property taxes, home mortgage interest, standard mileage, child care, and charitable contributions. But if you're self-employed, you need all the extra help you can get your hands on.

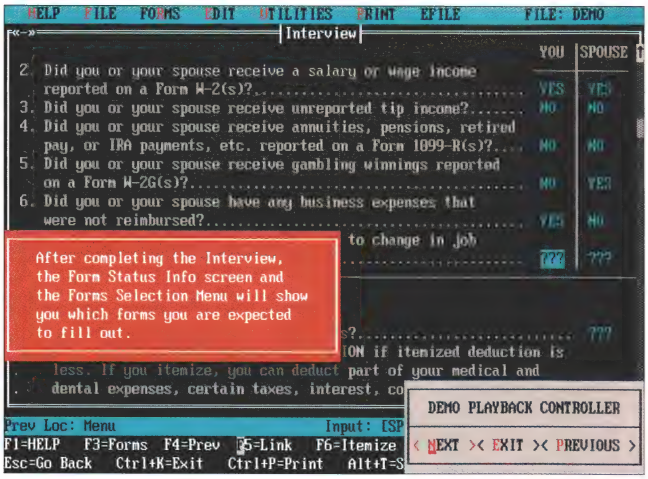
The self-employed must complete at least two (possibly four) of the most fearsome IRS forms, and however scrupulous your entries, the eyes of tax folks are upon you. Unless you're self-employed as a CPA, you'll have to take your taxes to a live accountant. While H&R Block cheerfully and promptly gave us all the right answers, not one of the programs accurately handled all aspects of self-employment forms.

Landlords shouldn't fire their accountants, either. These programs don't handle property depreciation any better than they handle other varieties of depreciation.

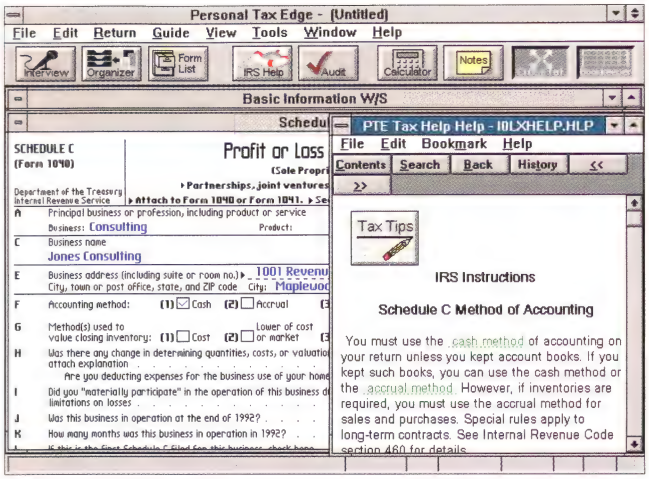
Despite their promises of automatic recalculation, all programs demonstrated serious calculation failures in the self- employment forms. Two of them (*TaxPerfect* and *Tax Solver*) failed entirely to calculate self-employment tax (a dragon's tooth that spawns further errors). None of the programs calculated the maximum allowable SEP-IRA deduction (a percentage of income), so our test-case taxpayers would have buried $1215 too much in an IRA, and then faced an additional tax bill and fine.

Perils of the Home Office

Dealing with the expenses involved in operating a home office also overtaxed all programs. As a result of a missing link (form 8829 to Schedule A), no program subtracted from the Schedule A home deductions the percentages we'd already deducted for the home office—a $1000 double-dipping audit magnet. No program asked the right questions to reach a correct car expense calculation. Only two (*AM-Tax* and *TaxCut*,) could automatically calculate depreciation on the business part of the home. In fact, the usually competent *TurboTax* head start edition was so discombobulated, it kicked us



EASYTAX'S DEMO PROGRAM introduces the program's features and shows how straightforward the interview process can be.



PERSONAL TAX EDGE'S WINDOWS VERSION has real-looking forms and uses the Windows Help system to guide you through your return.

for instance, any version of "automobile"). A permissive on-line audit identifies potentially dangerous deductions but ignores missing or misformatted fields that the IRS will resent.

EasyTax offers 24 state tax modules and supports 66 forms. Should you fall asleep at the monitor, on April 15 a unique Tax Calendar/Alarm will tug your sleeve until you rise and file.

EasyTax, SoftKey Software Products; 407/367-0005

Reader service no. 672

Personal Tax Edge

WINDOWS The most striking feature of Parsons' *Personal Tax Edge* is its user guide. Its index is rich, its instructions good-looking and clear. Not only is there a chart suggesting what evidence you'll need for certain entries, but a generous series of appendices includes program information, lists of IRS publications (and how to get them), tax forms (and what they cover), and even a DOS guide.

Would that the program were equally supportive. While taxing your patience with the pokey pace of its calculations, its phlegmatic interview mingles the austere vocabulary of the tax forms with the redundancies of a myopic bureaucrat. (Instead of asking "Did you or your spouse receive interest?" it asks "Did you receive interest?" and then "Did your spouse...?" "Did you jointly...?") The interview often abandons you in midform, leaving you perplexed about whether to fill in all the blanks or hit the Resume Interview button. We found ourselves leaving some forms half-completed and even omitting important deduction worksheets. Tax help is ample but unhelpful, cut whole-cloth from the IRS's inimitable prose.

The program lacks the scope to catch subtle inconsistencies. When we accepted the program default of 0 for "dependents eligible for care," *PTE* just blanked subsequent child care entries rather than pointing out the four-year-old listed on the 1040. However, the line-by-line final audit is laudably nitpicky about formats, and the program offers the option of flagging estimated figures.

Personal Tax Edge supports 50 forms and 42 state tax modules.

Personal Tax Edge, Parsons Technology; 800/223-6925

Reader service no. 673

Tax Solver

WINDOWS For those whose finances are spreadsheet-based, *Tax Solver* offers help in the form of add-ins for *1-2-3* and *Excel*.

Start your return by choosing which forms you expect to need. Should you forget any, return to this forms menu to open them. You also have to keep them all open until the return is complete, or else transfer calculations manually from closed forms to any linked documents. Although the program officially requires only 40K more than the spreadsheet, our 4MB of RAM soon ran out. As a result, we had to close some forms, yielding dubious results.

Tax Solver presumes complete comfort in a spreadsheet environment. It's harder to learn than most programs (requiring some tricky, counterintuitive moves); you'll probably need frequent consultations with the clear, dry manual.

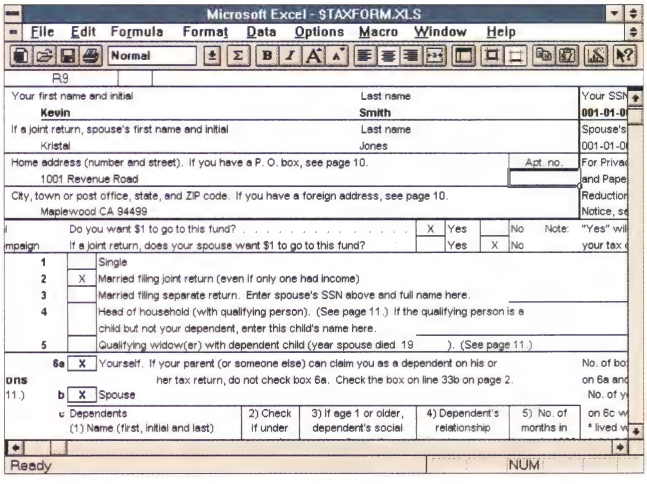
In two tries we experienced numerous calculation and transfer errors, possibly the result of broken forms linkages. For example,

out of our house (form 8829) and bounced us to the cars-and-computers worksheet (form 4562).

Depreciating business equipment was equally dire: The software won't make the hard choice when the IRS coos, "Our specials tonight are MACRS and ACRS, in half-year or mid-quarter portions." *TaxCut*'s superb on-line translations of this terminology allowed us to depreciate a computer correctly (and even amortize the software) but stalled on the automobile. And while *EasyTax* and *Personal Tax Edge* offered extensive depreciation guidelines, their arcane IRS phrasing left us helpless.

In contrast, for just $181, H&R Block managed the whole self-employment morass smoothly and passed our auditor's inspection. Although slightly skimpy on documentation, the firm's final calculations were substantially correct and defensible. (H&R Block is a franchise operation, so we can't guarantee that the accountant you get will be equally good.)

We concluded that if you're self-employed and you've got any business equipment beyond a 10-cent ballpoint, you're better off paying a human tax expert to do your return.



TAX SOLVER RUNS UNDER 1-2-3 AND EXCEL. Using Excel's capabilities, it produces a creditable-looking 1040 on screen and on paper.

the only Schedule C deductions that transferred from the supporting worksheets were those for mortgage interest and utilities. Failing to calculate self-employment tax was a potentially disastrous omission. A minimal audit picks out fields that differ from the national average, and what-if scenarios and calculation overrides can be evoked by changing cells on the spreadsheet.

Tax Solver's personal version supports 102 tax forms and has modules for three states.

Tax Solver, Intex Solutions; 617/449-6222

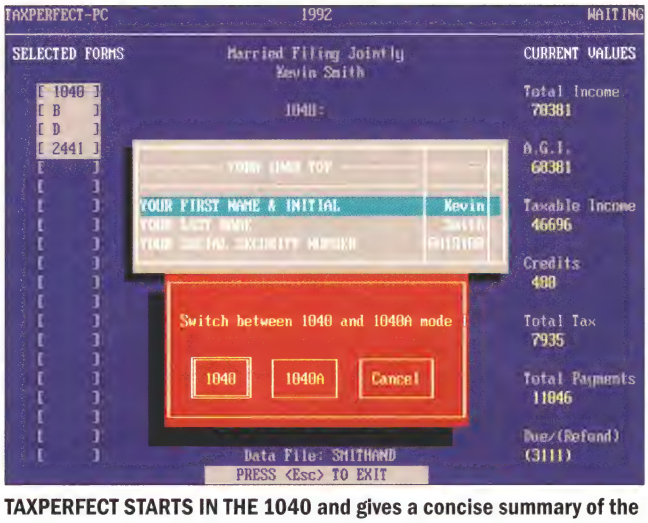
Reader service no. 674

TaxPerfect

TaxPerfect is another classic program, whizzing you through the 1040 while identifying entries that require completion of a supporting schedule or worksheet. Your bottom-line taxes appear under Current Values Display. Function keys can issue commands, switch forms, and recalculate the return. A stand-alone Depreciation Module may benefit users who know their ACRS from their MACRS.

The jargon-filled loose-leaf Operators Software Manual includes a forms appendix that tersely indicates what data goes on each form.

TaxPerfect's return included several calculation or forms linkage



TAXPERFECT STARTS IN THE 1040 and gives a concise summary of the state of the return as you make changes.

failures connected to self-employment, the worst being the omission of self-employment tax, which the on-line audit didn't detect.

The personal version of *TaxPerfect* supports 57 forms, but offers no state modules. Electronic filing is available only with the professional modules.

TaxPerfect, FSMC Corp.; 800/525-5611

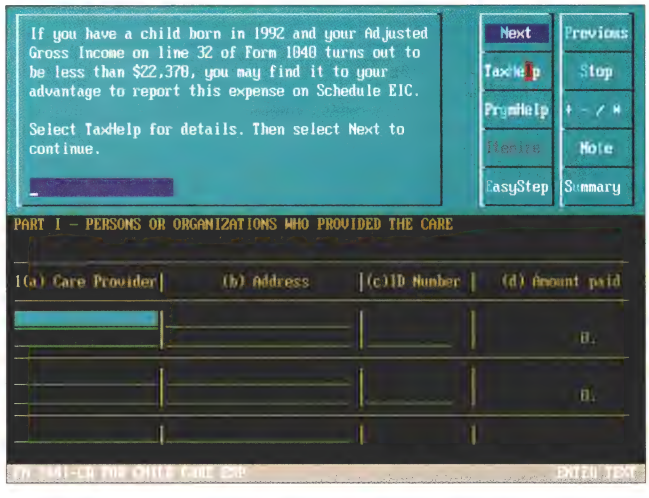
Reader service no. 675

TurboTax

WINDOWS *TurboTax* is the market leader of personal tax programs. The wit of its pop-up Tax Help comments, along with the full-length interview, make filling out the forms almost a pastime. For the tax tyro, though, it remains harder to handle than *TaxCut.*

The interview questions are generally clear (although some read like either/or when they're really yes/no). The tax help available is so comprehensive (except on the deadly topic of depreciation), it turns your *TurboTax* session into an enlightening tax law seminar.

On the downside, the program's prompts cover all but a narrow



TURBOTAX HOLDS YOUR HAND as you fill out your return. In some cases, you type a word or two; in most, pushing a button will do.

slit in the screen, so you can't see most of the form, and you can't switch freely to the forms module for a better view (or reach the Calculation Override button). Hence, along with feeling disoriented, you risk flinging data into spaces that sound right, but aren't.

The Filebox Review (shoe box) lets you locate remembered errors by topic—but may tempt you into new goofs. A home gardener tempted by Seeds and Plants may be suddenly cultivating a phantom freesia farm—and the audit function won't care if this plunge into agribusiness contradicts earlier entries. Still, *TurboTax* was one of the most generally accurate programs in our tests.

TurboTax offers 44 state tax modules for DOS and 15 for *Windows,* and supports 90 forms, schedules, and worksheets.

TurboTax, ChipSoft, Inc.; 619/453-8722

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Naomi Wise is a San Francisco–based freelance writer. Richard Melville is an editorial intern for PC World.

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FEATURES COMPARISON

Tax Software by the Numbers

● Yes
○ No

	AM-Tax	Andrew Tobias' TaxCut	EasyTax	Personal Tax Edge	Tax Solver	TaxPerfect	TurboTax
Standard features							
Price	$40	$79.95	$79.95	$49	$79.95	$99	$79.95
State tax package	$30	$24.95	$29.95	$49	$39.95	○	$49.95
Memory required	512K	640K	640K	640K	40K [1]	640K	640K
Oldest DOS version supported	2.0	3.3	3.0	2.1	2.1	3.0	3.0
Windows version	○	●	○	●	●	○	●
Federal forms supported	60	85	66	50	102	57	90
State modules available	22	23	24	42	3	0	44 DOS, 15 Windows
Tax help							
Interview format	○	●	●	●	○	○	●
Identifies required forms	○	●	●	●	○	○	●
On-line tax adviser	○	●	●	○	○	○	●
On-line IRS instructions	○	●	●	●	●	○	●
Tax guide included	○	○	○	○	○	○	○
Tax planner	○	○	●	○	○	●	●
What-if analysis	●	●	●	●	● [2]	○	●
Audit detector	○	●	●	●	●	●	●
Audit trail printout	○	●	●	●	●	○	●
Preparation tools							
Built-in calculator	●	●	●	●	●	●	●
Calculation override	●	●	●	●	●	●	●
Automatic recalc after entry	●	●	●	●	●	○	●
Info link between forms	●	●	●	●	●	●	●
Ease of use							
Pulldown menus	●	●	●	●	● [2]	●	●
On-screen forms	●	●	●	●	●	○	●
On-line software help	○	●	●	●	○	●	●
On-line tutorial	○	●	●	●	○	○	●
Data import feature	○	●	●	●	●	○	●
Output							
Prints fileable IRS forms	●	●	●	●	●	●	●
Requires special forms	○	○	○	○	○	●	○
Electronic filing	○	●	●	●	○	○	●
Support							
Toll-free tech support	○	○	○	○	○	○	○
Hours available	8	9	8	12.5	8	8	8.5
Hours January through April	10	15	11	12.5	11	8	13.5
Weekend support	○	● [3]	○	●	● [4]	○	●
Fax	●	●	●	●	●	●	●
BBS	○	●	●	● [5]	○	○	●

[1] Plus memory needed for spreadsheet program.
[2] Appears on spreadsheet.
[3] February through April.
[4] January through April.
[5] CompuServe or GEnie.

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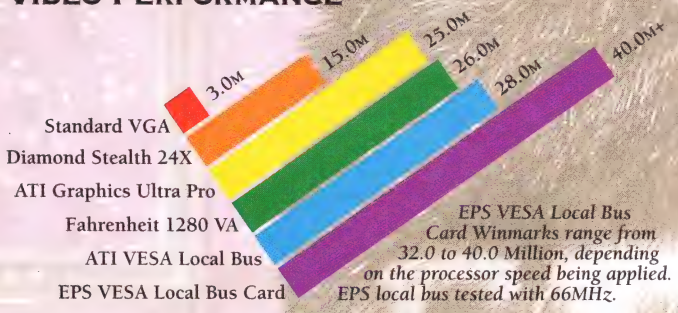

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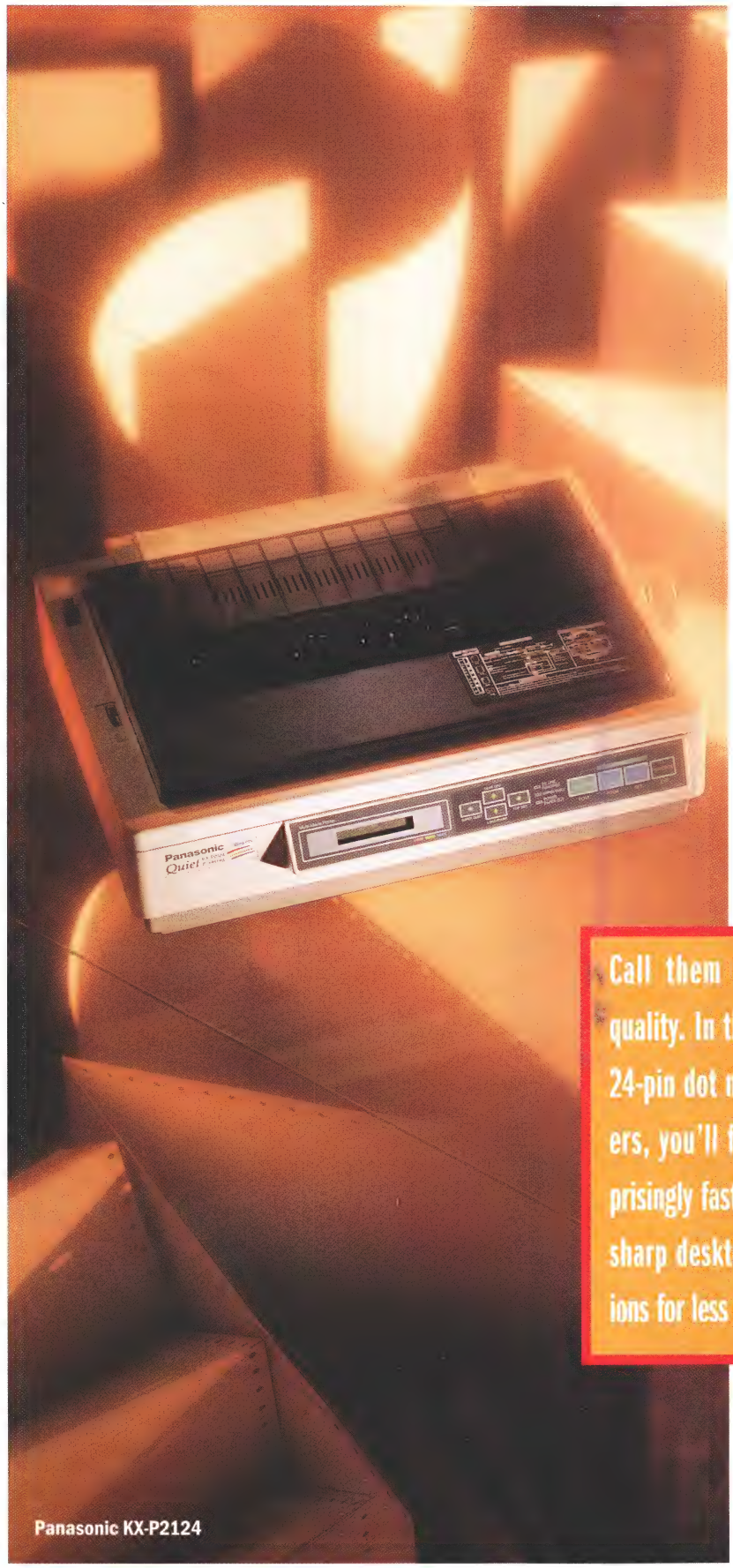


Panasonic KX-P2124

MICHAEL VENERA

DOT Matrix Lives!

Call them near laser quality. In this guide to 24-pin dot matrix printers, you'll find 32 surprisingly fast, quiet, and sharp desktop companions for less than $750.

It's official. You're finally getting the new printer you've needed for years. No more fighting for access to the laser down the hall; from now on, your printer will be right there on your desk. So what'll it be? A laser? An ink jet? A dot matrix?

Dot matrix! Wouldn't putting a dot matrix printer on your desk be like parking a DeSoto in your driveway? Not necessarily. We took a fresh look at these machines and discovered that while all the better-hyped printers were getting faster and cheaper and sharper, so were dot matrix printers, particularly 24-pin models. They're quicker than they used to be, whipping out lightning fast drafts. They're quieter, some as quiet as a laser. And they provide better

BY RICHARD MELVILLE

print quality than before—some even come with scalable fonts. Plus, they perform a few stunts the jet set can't, at prices it can't beat.

Consider a few numbers. First the low ones: We allowed ourselves a top price of $750 and rounded up nearly three dozen candidates, with the Epson ActionPrinter 3250 lowballing the field at $269 list. For those who like high numbers, how about 360-dot-per-inch (dpi) resolution, sharp enough for crisp fonts and line graphics?

In case you've forgotten, dot matrix printers can handle some jobs most lasers can't touch. They print multipart forms and accommodate an enormous variety of paper sizes, from any kind of label to 11-by-17-inch sheets. Most dot matrixes also feature paper parking, which shunts continuous-feed paper aside while you run envelopes, letterhead, or single sheets through, saving time and paper. Swap in a module or special ribbon on some, and you can even print in color.

So why not really save and just buy a 9-pin? Some 9-pin printers perform many of the paper-handling tricks their big brothers do, but they can't give you high-quality output that comes oh-so-close to laser quality. Put to the TrueType test, the 24-pin clearly outshines the 9-pin (see output samples).

This buyers' guide covers 32 24-pin dot matrix printers, all of which list for under $750, less than any laser. Since many people buy dot matrix printers for special purposes such as printing multipart forms or labels, we surveyed each printer's skills at a variety of paper-handling jobs. Clearly, today's dot matrix puts more options at your fingertips than linefeed and formfeed.

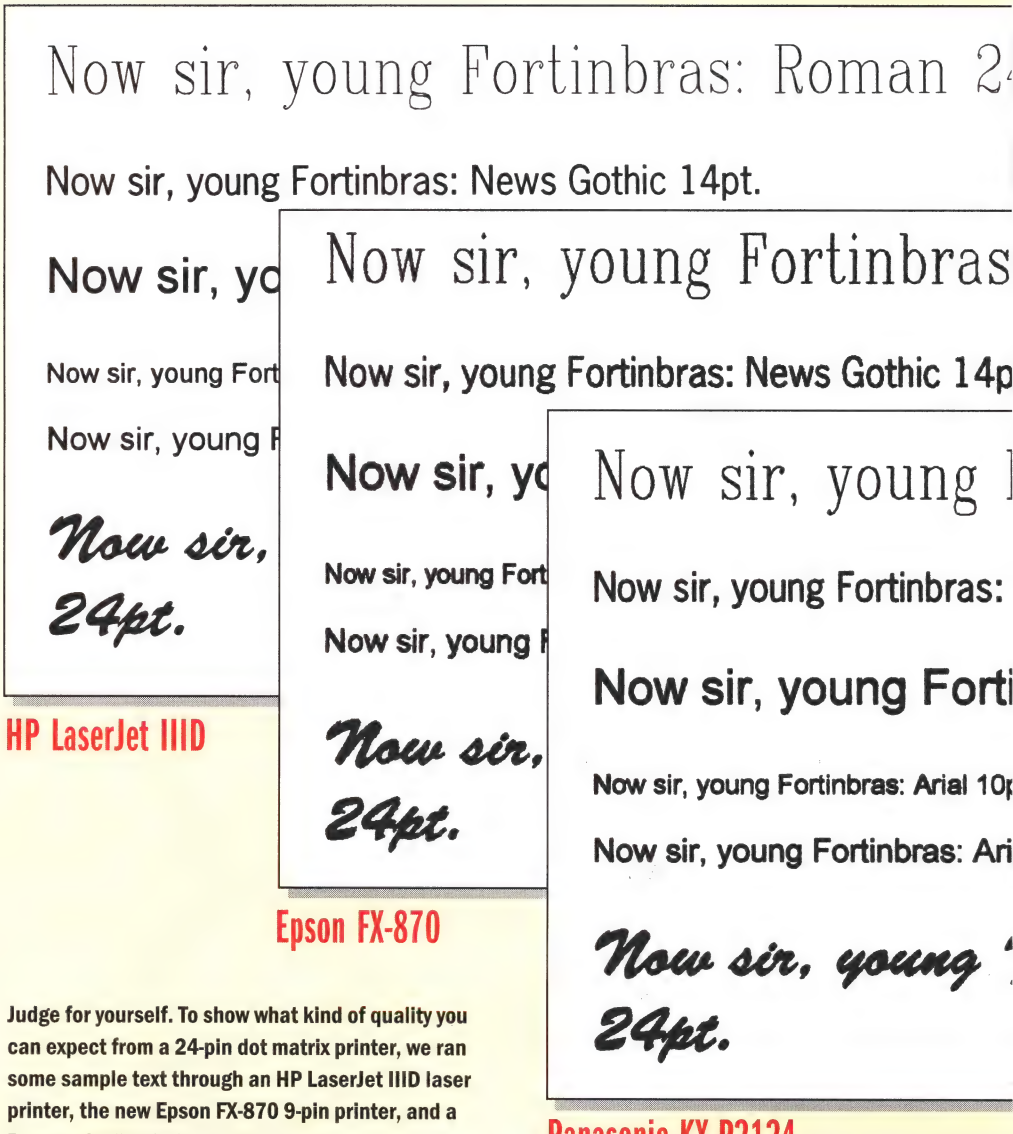
A printer's speed depends on two factors. The first is obvious: the number of characters per second (cps) it prints. The second is just as important: How soon after you start the print job will your PC deliver a document and be available for use? The first depends on how fast the printhead lays ink on the page; the second involves the printer buffer's size.

A Fast Crowd

Contrary to popular belief, dot matrix printers are not necessarily slow. In draft mode, many dash through plain text at better than 300 cps. Comparing cps ratings can help you determine which machine prints fastest, but it won't tell you how quickly a particular unit will crank out a document. Taking the dot matrix standard deductions into account (paper feed time, printhead movement time, and so forth), you can expect two to four pages per minute. The fastest printers in our sample better that by 25 to 33 percent: The Star Micronics XB-2420 whips along at 375 cps, while the Epson LQ-870 churns out 413 cps and the Okidata Microline 590 a blazing 450 cps.

Letter quality printing generally takes three times as long as draft quality. With the fastest dot matrix printers, that's about 140 cps. NEC's Pinwriter P6200 produces 150 cps in "Quick Gothic letter quality," which is actually somewhere between draft and letter quality; the Epson LQ-870 nearly matches that in standard letter quality. Finally, graphics on your dot matrix take even longer than letter quality text.

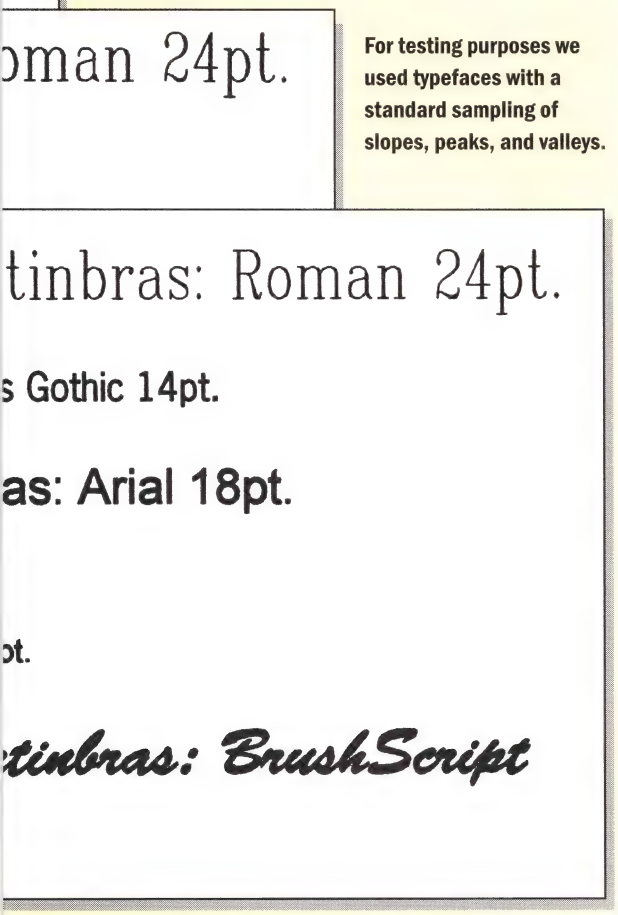
How Good Is Good?



Judge for yourself. To show what kind of quality you can expect from a 24-pin dot matrix printer, we ran some sample text through an HP LaserJet IIID laser printer, the new Epson FX-870 9-pin printer, and a Panasonic KX-P2124 24-pin printer.

Speed aside, if the buffer has only enough memory to hold a page or two, your PC will be useless during large print jobs as it waits to load pages into the printer. We found that virtually all 24-pin printers pack at least 8K of storage space. You need about 3K per page of text if you use a printer-resident font, more if you don't. At that rate, 8K gets gobbled up quickly. Many printers come with larger or expandable buffers. Both Brother printers, for instance, have 64K of buffer space (room for more than 20 pages) in their standard configurations. If that's not enough, two Citizen printers expand all the way to 136K, enough for 45 pages of text.

The output confirmed what we already suspected: Dot matrix printers can't duplicate laser output. However, as you can see, 24-pin printers smooth out most of the bumps and bulges that even advanced 9-pin models like the Epson generate.



For testing purposes we used typefaces with a standard sampling of slopes, peaks, and valleys.

Paper Handling

Think about how many types of paper you'll need to work with. At one time or another, everyone needs to print on odd-size paper or switch between letterhead and envelopes. Do you want to print multipart forms? One printer we looked at can handle only a two-layer multipart, but others pound out forms five deep. Such paper-handling wizardry is the reason people stand by their dot matrixes.

More important, the days of waste are gone. With paper parking, you can print a letter or an envelope without having to discard several sheets of continuous-feed paper. The printer "parks" the continuous-feed paper behind the single sheet, allowing your envelope or letterhead to slide by. When that job is finished, you flip the continuous-feed paper back into position without a time-consuming reload.

Finally, consider the paper paths on these printers. If you can send paper past the printhead in two or three ways, you can preset each path for a different paper thickness and size. This simplifies the job of switching between envelopes or labels and standard single sheets. Several printers offer top loading only, while others load from the top, bottom, front, or rear. With the Epson ActionPrinter 3250, this flexibility allows you to turn the printer on its side for a smaller footprint.

Sharpness and Style

Even if these printers are faster than you thought, will their output leave you wondering if you should have bought a bargain laser? This question is tricky, and the answer depends on you and your work style.

Dot matrix printers with 360-dpi resolution actually deliver more dots per inch than most lasers. However, there's more to print quality than resolution. Since the dot matrix's dots are larger than a laser's and don't always line up evenly, you can't rely on them for overheads or fancy graphics, especially those that require halftones. Very small pitches and complex fonts are also out of the dot matrix range. Where these printers are good, though, they're very good. Using basic block fonts like Helvetica in 10- or 12-pitch, they'll produce text so sharp you might even entrust your résumé to it.

In case you've forgotten, dot matrix printers can handle some jobs that most lasers can't touch.

Output quality is only part of the game. Look for a printer with a variety of resident typefaces. Panasonic's KX-P2124 and Star Micronics's XB-2420 Multi-Font both offer 12 resident fonts in fixed point sizes. Even better, Epson and Citizen offer printers with built-in fonts that are scalable from 8 to 32 points.

With the widespread availability of type management software, just about any printer can scale fonts. Panasonic, for instance, bundles *Adobe Type Manager* with its printers, providing *Windows* users with 13 PostScript fonts in addition to the printer's resident typefaces. Moreover, *Windows 3.1* users have access to TrueType fonts, which any printer can use. Remember, however, that software-generated fonts can take as long to print as a graphics job. Resident fonts print much faster—so the more resident fonts your printer has, the faster you'll be able to print a variety of jobs.

Easier on the Ears

Noise was once the bane of anyone who worked near a dot matrix printer, but many of today's models have solved that problem. Most of the models listed here offer a quiet mode, which softens the noise level by several decibels. A 3db drop usually cuts the noise by half, but you'll also take a 50 percent drop in print speed. For both speed and quiet, Citizen, Epson, and Panasonic offer printers that run at 47db in standard mode—well below what most printers generate in quiet mode. Quiet mode cuts their noise to about 43db, barely above the 41db that laser printers produce.

Fingertip Controls

You don't have to print a single page to notice something new about these printers—just take a look at their control panels. As on your VCR, buttons and displays galore offer plenty of scope for you to express yourself. Gone are the days when your choices were limited simply to feeding a form or a line. Indeed, many of these dot matrix machines are practically programmable. With the Citizen GSX-240, for instance, you can create printer macros right on the control panel that switch font and formatting information.

Scan the standard features on today's dot matrix printers, and you will find LCD screens that guide you through font changing, margin and form adjustments, microline feeding (up to ½ inch), and a number of other settings. Make sure that at least the essential functions are easy to adjust. Setting linefeed and formfeed and making font and pitch changes shouldn't take more than a touch or two of the controls.

24-Pin Dot Matrix Printers

			KEY FEATURES						FONTS			
Manufacturer	Product	Price	Dimensions (inches)	Weight (pounds)	Draft/LQ speed (cps)	Standard/ maximum buffer size (K)	Noise (db)	Quiet mode	Resident typefaces	Scalable fonts	Maximum resolution (dpi)	Cartridge slots/ cartridges available
AEG Olympia 800/926-6546, 214/688-1764 (fax)	NP 80-24	$483	5 x 17 x 14	18	200/67	24/56	57	●	6	○	360 x 360	1/1
	NP 136-24	$518	5 x 24 x 14	22	240/80	24/56	57	●	6	○	360 x 180	1/1
ALPS America 800/828-2577, 408/432-6035 (fax)	Allegro 500	$499	7 x 18 x 12	13	216/72	12/44	55	○	7	○	360 x 360	0/0
Brother Int'l 800/284-4357, 908/356-4085 (fax)	M-1824L	$749	6 x 19 x 15	20	337/112	64/96	55	●	5	○	360 x 360	1/1
	M-1924L	$749	6 x 24 x 15	26	337/112	64/96	55	●	5	○	360 x 360	1/1
Citizen America 800/477-4683, 310/453-2814 (fax)	GSX-145	$599	6 x 23 x 13	17	192/64	8/40	51	●	6	○	360 x 360	0/0
	GSX-230	$399	5 x 17 x 13	11	270/90	8/136	47	●	8	○	360 x 360	1/6
	GSX-240	$519	5 x 17 x 13	11	300/99	8/136	47	●	13	●	360 x 360	1/1
DCS/Fortis 800/736-4847, 310/782-6134 (fax)	DQ4210	$589	5 x 18 x 14	19	240/80	24/56	57	●	6	○	360 x 180	1/1
Epson America 800/922-8911, 310/782-5220 (fax)	ActionPrinter 3250	$269	5 x 15 x 10	12	250/90	11/11	50	●	6	●	360 x 360	0/0
	ActionPrinter 5000	$499	6 x 17 x 15	15	315/105	8/128	47	○	10	●	360 x 360	0/0
	ActionPrinter 5500	$699	6 x 24 x 15	15	315/105	8/128	55	○	10	●	360 x 360	0/0
	LQ-570	$499	6 x 17 x 15	15	315/105	8/128	47	○	10	●	360 x 360	0/0
	LQ-870	$749	7 x 18 x 15	20	413/138	8/128	55	○	10	●	360 x 360	0/0
	LQ-1070	$699	6 x 24 x 15	19	315/105	8/128	55	○	10	●	360 x 360	0/0
Lexmark 800/358-5835, 606/232-2380 (fax)	IBM PPS II Model 2390	$499	8 x 20 x 11	15	200/60	32/64	55	●	8	○	360 x 360	1/1
	IBM PPS II Model 2391	$699	8 x 25 x 11	19	200/60	32/64	55	●	8	○	360 x 360	1/1
NEC 800/632-4636, 800/366-0476 (fax)	Pinwriter P3200	$429	6 x 17 x 14	19	216/72	8/8	52	●	7	○	360 x 360	0/0
	Pinwriter P3300	$599	6 x 23 x 14	25	216/72	8/8	52	●	7	○	360 x 360	0/0
	Pinwriter P6200	$749	8 x 17 x 14	23	300/100	80/80	54	●	8	○	360 x 360	1/8
Okidata 800/654-3282, 609/778-4184 (fax)	Microline 590	$699	6 x 17 x 15	17	450/120	64/64	53	●	8	○[3]	360 x 360	0/0
Panasonic 800/742-8086, 201/392-4792 (fax)	KX-P2123	$419	6 x 18 x 14	19	240/80	14/46	47	●	10	○[3]	360 x 360	0/0
	KX-P2124	$549	6 x 17 x 14	19	320/106	20/52	47	●	12	○[3]	360 x 360	0/0
	KX-P2624	$649	7 x 23 x 16	34	300/100	26/58	47	●	11	○[3]	360 x 360	0/0
Seikosha 800/338-2609, 201/818-9135 (fax)	LT-20A Laptop Printer	$499	2 x 15 x 11	6	180/60	1/12	55	●	1	○	360 x 180	1/1[4]
	LT-20XL Battery Ready Laptop	$549	2 x 15 x 11	6	180/60	1/12	55	●	1	○	360 x 180	1/1[4]
	SL-90 Plus	$499	5 x 15 x 11	9	240/80	12/12	56	●	9	○	360 x 360	0/0
Star Micronics 800/447-4700, 212/286-9063 (fax)	NX-2415 Multi-Font	$599	5 x 23 x 13	20	200/67	11/43	54	○	4	○	360 x 360	1/1
	NX-2420 Rainbow	$499	6 x 18 x 14	15	250/83	30/62	53[5]	●	7	○	360 x 360	1/4
	NX-2430 Multi-Font	$399	6 x 17 x 13	14	240/80	16/48	54	●	11	○[3]	360 x 360	1/8
	XB-2420 Multi-Font	$749	6 x 18 x 16	22	375/125	29/157	52	●	12	○	360 x 360	1/2
Unisys 800/448-1424, 215/986-2312 (fax)	AP 1337	$699	5 x 16 x 14	19	270/90	8/40	55	○	8	○	360 x 360	1/1

[1] Standard feature.
[2] Minimum label width 2.5 inches.
[3] Scalable soft fonts bundled with printer.
[4] ROM chip upgrade.
[5] Rating assumes quiet mode.

Plug and Go

For most users of dot matrix printers, the best type of interface is a parallel port—it's faster than using the serial port. However, if you absolutely must use a serial port, there are plenty of printers that include both interfaces, and many others offer a serial port option.

At least one company, Epson, uses the serial interface as the home for its buffer upgrades, enabling you to squeeze the most out of available resources.

Less is more may sum up this generation of 24-pin dot matrix printers best. They offer style and flexibility and possess a blue-collar work ethic that you'll appreciate, at a price that will fit your budget. These old dogs of printing have learned a few new tricks and still do some of the old ones better than any other printer at any price.

Richard Melville is an editorial intern for PC World. *He can be reached on PC World Online (see page 8 for more information).*

PAPER HANDLING							FRONT-PANEL CONTROLS					OTHER OPTIONS			
Optional sheet feeder	Form parking	Envelopes	Labels	Maximum form width (inches)	Maximum form parts	Paper paths	Pitch	Font	Line spacing	Margins	Microline	Serial interface	Color printing	Warranty	Reader service number
●	●	○	●	10	3	1	●	●	●	●	○	●[1]	○	90 days	649
●	●	○	●	16	3	1	●	●	●	●	○	●[1]	○	90 days	649
●	●	●	●	9	4	1	●	●	●	●	●	●	○	1 year	650
●	●	●	●	11	5	1	●	●	○	○	○	●[1]	●	1 year	651
●	●	●	●	16	5	1	●	●	○	○	○	●[1]	●	1 year	651
●[1]	●	●	●	16	4	3	●	●	●	●	●	●	●	2 years	652
●[1]	●	●	●	10	4	3	●	●	●	●	●	●	●	2 years	652
●[1]	●	●	●	10	4	3	●	●	●	●	●	●	●	2 years	652
●	●	○	●	10	3	2	●	●	●	●	●	●[1]	○	1 year	653
●	○	●	●	10	2	2	○	●	●	○	●	○	○	2 years	654
●	●	●	●[2]	10	4	4	○	●	●	○	●	●	○	2 years	654
●	●	●	●[2]	16	4	4	○	●	●	○	●	●	○	2 years	654
●	●	●	●[2]	10	4	4	○	●	●	○	●	●	○	2 years	654
●	●	●	●[2]	10	4	4	○	●	●	○	●	●	○	2 years	654
●	●	●	●[2]	16	4	4	○	●	●	○	●	●	○	2 years	654
●	○	●	●	8	4	1	●	●	●	●	○	●	○	2 years	655
●	○	●	●	13.6	4	1	●	●	●	●	○	●	○	2 years	655
●	●	●	○	10	3	2	●	●	●	●	●	●	○	1 year	656
●	●	●	○	16	3	2	●	●	●	●	●	●	○	1 year	656
●	●	●	●	10	4	3	●	●	●	●	●	●	●	1 year	656
●	●	●	●	8.5	5	3	●	●	●	●	●	●	●	2 years	657
●	●	●	●	12	4	3	●	●	●	●	●	●	●	2 years	658
●	●	●	●	12	4	4	●	●	●	●	●	●	●	2 years	658
●	●	●	●	16	4	4	●	●	●	●	●	●	○	2 years	658
●	○	○	●	10	3	2	○	○	○	○	○	○	○	2 years	659
●	○	○	●	10	3	2	○	○	○	○	○	○	○	2 years	659
●	●	○	●	10	3	2	●	●	○	●	○	○	○	2 years	659
●	●	○	○	17	3	2	●	●	○	○	●	●	○	2 years	660
●	○	○	○	12	5	3	●	●	○	○	●	●	●[1]	2 years	660
●	●	○	○	11	3	3	●	●	○	○	●	●	○	2 years	660
●	●	○	○	12	5	3	●	●	●	●	●	○	●	2 years	660
●	●	○	●	10	5	2	●	●	○	○	○	●	○	1 year	661

For more information about all products in this table, circle reader service no. 901.

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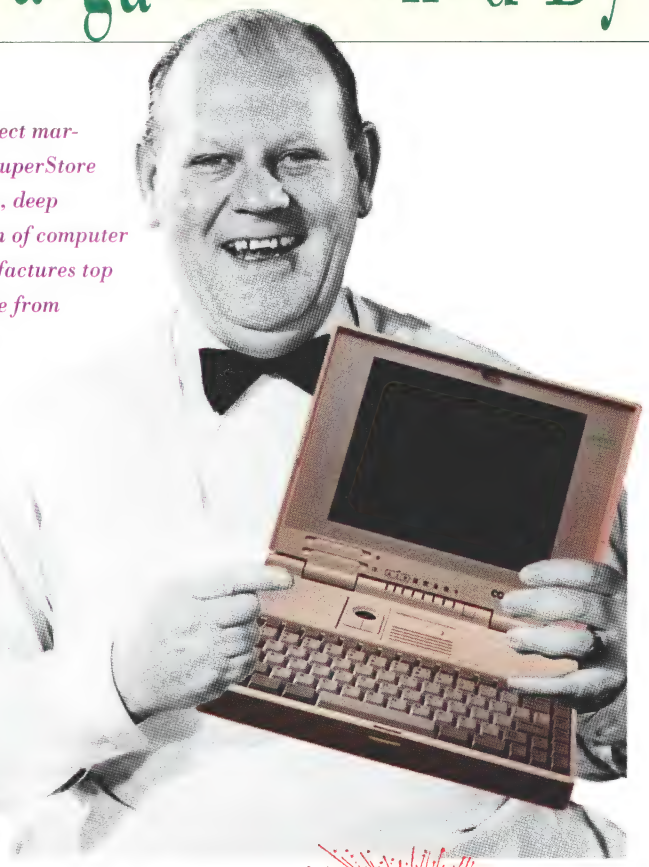

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486DX/33 Best Buy, Laptop Issue, Sept. 1992

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386SL/25	INTEL 80386SL-25 MHz 64K CPU CACHE ADVANCED SL POWER MGM'T	80	$1,499 $56/mo*
486SX/33	INTEL 80486SX-33 MHz 8K CPU CACHE	80	$1,999 $74/mo*
486DX/33	INTEL 80486DX-33 MHz 8K CPU CACHE	130	$2,499 $93/mo*

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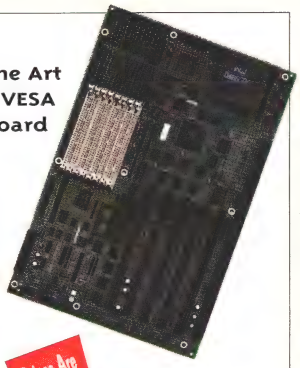

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486SX/33††	INTEL 80486SX-33 MHz 8K CPU CACHE	4 STANDARD/ 120 MB HD	16 BIT SVGA CARD/ 14" 1024x768 SVGA COLOR MONITOR	$1,199 $44/mo*
486DX/33 CACHE	INTEL 80486DX-33 MHz 128K CPU CACHE	4 STANDARD/ 170 MB HD	16 BIT TRUE COLOR SVGA WINDOWS ACCELERATOR CARD WITH 1 MB RAM / 14"1024x768 SVGA NON-INTERLACED COLOR MONITOR	$1,599 $59/mo*
486DX2/50 CACHE	INTEL 80486DX2-50 MHz 128K CPU CACHE	4 STANDARD/ 200 MB HD	AS ABOVE	$1,799 $67/mo*
486DX/50 CACHE	INTEL 80486DX-50 MHz 128K CPU CACHE	4 STANDARD/ 200 MB HD	AS ABOVE	$1,999 $74/mo*
486DX2/66 CACHE	INTEL 80486DX2-66 MHz, 128K CPU CACHE, NEW DOUBLE CLOCK CPU	8 STANDARD/ 340 MB HD	AS ABOVE	$2,399 $93/mo*

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486SX/25 Best Buy, Dec. 1992

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PCW0331

Circle 14 on reader service card

Getting There With SOFTWARE MAPS

Looking for the fastest route to a local hot spot? Or a quick idea of your company's sales nationwide? Today's hot-selling travel and mapping analysis programs provide a bird's-eye view.

By Laura Lang

Maps lift you above normal perception and show you how to get from one place to another. Computers enable you to analyze and manipulate vast quantities of data. Put maps and computers together, and you have a supremely intuitive tool for visualizing information.

Descended from mainframe geographic information systems (GIS), today's mapping programs have shucked their command-driven heritage and five-digit price tags in favor of point-and-click operation and attractive pricing. Software maps of regions, states, cities, and towns can bring all forms of location-dependent information to life, from the latest sales data to the address of the piano bar nearest your hotel. If you've ever consulted a travel guide, stuck push pins in a wall map, or planned sales calls with a database printout, you're a candidate for a mapping package.

Mapping software comes in two basic varieties. The simpler programs do what paper maps have always done—help you navigate—and sell for as little as $59.95. The more sophisticated versions are research and analysis tools that generally start at $500. Linked to financial or demographic databases, they can monitor sales, track

LOUIS FISHAUF

personnel, or even identify new markets.

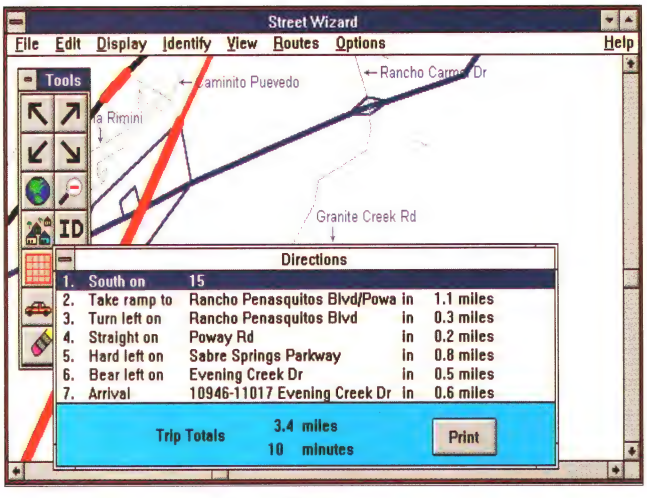
Daratech, a Cambridge, Massachusetts, market research firm, projects that 1992 will show a 42 percent increase in the use of mapping software for analysis, and that sales of routing, trip planning, and presentation products will hit $200 million—a "phenomenal" growth rate, according to Daratech. Perhaps because maps provide the world's most intuitive graphical interface, businesses seem to be warming to mapping software without the skepticism that usually greets a new application genre.

Navigating New Territory

Anyone who travels will find that a good navigation package can turn a laptop computer into a trusted tour guide. Navigation products can provide instant directions in an unfamiliar city, help plan long trips, recommend places to sleep and eat, or even help you plan a nearby jogging route.

The capabilities of navigation programs depend on the type and quantity of information they contain. Generally, there's a trade-off between breadth and depth. Products such as *PC Globe* cover the United States and a host of foreign countries but offer little local detail. True electronic travel guides, such as *Zagat-Axxis CityGuides*, provide a wealth of information on hotels, scenic attractions, and restaurants. Such information-rich packages can eat up disk space in a hurry; *Zagat-Axxis CityGuide: New York*, for instance, gobbles up more than 7MB of space.

Some of the programs allow you to customize maps to include your own information on people and places, an especially practical feature for anyone who frequently visits out-of-town clients. Terry L. Brock, president of Achievement Systems in Norcross, Georgia, uses the $169 *Street Atlas USA* when he visits small towns to deliver training seminars on office productivity. By typing in a phone number or ZIP code, he can zoom in on any area of the country. Running the $495 *Map-*



STREET WIZARD MAKES IT A BREEZE to get where you're going in new territories by popping up detailed directions.

New Yorker Challenges Laptop

Two years ago *PC World* lured me—an unrepentant New Yorker—to San Francisco, where I'm the acknowledged guru of all things Big Apple. Or was—until *Zagat-Axxis City-Guide* came along. It professes to know more about New York than I do—sacrilege! And even worse, you can take it with you on your laptop.

To me, this was a challenge: Who would you trust for advice on New York? A flesh-and-blood Manhattanite or some piece of software that probably couldn't tell a bagel from the Statue of Liberty? So I took up the challenge. On my last trip home, I dragged along a *Zagat*-loaded laptop to see who was king of the New York hill.

Full Size and in Color

I felt confident. On the black-and-white screen of my laptop, the *Zagat* map details don't look great. The icons are tiny, and all the streets are the same color, so it's hard to tell the main thoroughfares from the minor roads (though the program does look great on a color desktop PC). When I show someone around town, I'm charming, witty, and I provide plenty of anecdotes. I'm always full-size and in color. So I declared myself the winner of Round One.

Round Two would test our navigation skills. Give *Zagat* an address, even a partial address, and it will immediately pan to the requested area and zoom in or out. Click on any landmark and *Zagat* will identify it for you. It even found obscure addresses in The Bronx and in Secaucus, New Jersey—even on Aske Street in Queens, where my friend Eliot grew up. Okay, *Zagat* won that round.

Round Three was mine. I asked *Zagat* to locate 527 Sixth Avenue—a basic Manhattan address. It offered a choice of addresses in Staten Island or Brooklyn. Hah! That's because it calls Sixth Avenue by its official-but-never-used name—Avenue of the Americas. Ask a cab driver to take you to 527 Avenue of the Americas and you might as well have the word *tourist* emblazoned on your forehead. It would be like trying to buy tickets to see the New York Metropolitans—any local would call them the Mets.

Cabbies Don't Care

I claimed Round Four as well. Using *Zagat*, you can mark a beginning and end point of a trip, and it will tell you the best way to drive there. You can set preferences (local roads only, major highways only, minimize route zigzag, and so on). And it does a fair job, even recognizing one-way streets and going through the park to avoid traffic lights. But it has a fatal flaw: In Manhattan, at least, people don't drive. They hop in a taxi. Just try telling a New York City cab driver the best route to the Garden—fahgeddaboutit. Now, if this were car-crazy L.A., *Zagat* would have

Expert on top of *Street Atlas USA*, he can customize the maps with the addresses of his clients and add descriptive text. "It makes business traveling enjoyable again," says Brock. Instead of lugging tour guides, address books, and maps of each area with him, he prints customized maps with his route highlighted.

Concert promoter Bob Braun uses a combination of travel products, including *PC Globe*, The Software Toolworks' *World Atlas*, and *Automap for Windows: The Intelligent Road Atlas* to plan the details of Julio Iglesias's live concert tours. With *Automap*, Braun even provides printed directions for the drivers of the tour's buses and trucks. Of course, not all the information he needs is available in the packaged database supplied with the programs. But thanks to *Automap*'s built-in data management, Braun says, "I'm starting to build my own database by adding caterers, sound companies, and other information artists need on the road."

Zagat-Axxis CityGuides are perhaps the most impressive of the latest crop of travel packages. Like several others, they offer routing: Select two points on the map, and a highlighted path to your destination appears; one-way streets are accounted for. Enter an address, and the program shows you the location at your choice of several levels of magnification. Best of all, each *CityGuide* includes the locations of hundreds of hotels, restaurants, and attractions and enables you to search for them by proximity, price range, and a variety of additional criteria. At the moment, *Zagat-Axxis CityGuides* are available only for New York, Los Angeles, and Chicago, but the publisher has guides for other cities in the works.

WORLD ATLAS ZOOMS IN to find the population, government, modes of transportation and communication, and vital statistics for the area.

Strategic Mapping's *Local Expert*, which should be out for the PC by the time you read this, is intended to compete with *CityGuide* by offering more detail, more cities, and monthly updates. The base product and travel information for one city, which uses less than 2MB of disk space,

me beat, but in New York what you really need are subway and bus routes—and you won't find them in *Zagat*.

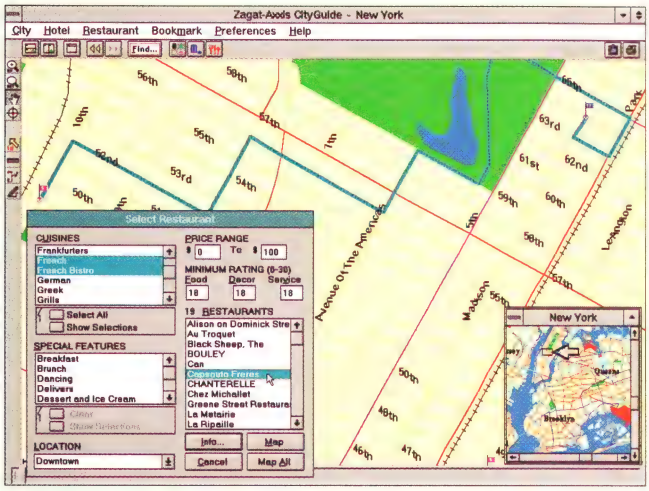
I quickly conceded Round Five—locating hotels. I'm a native, so I don't know much about the city's hotels. Still, for fun I did a few tests. You can get lists of the top ten hotels, best values, best service, and so on. Or you can pick an area, a desired feature (say, "Convenience to Convention Center" or "Power Scenes"), and a price range, and *Zagat* will spit out a list matching your criteria. Select a hotel from the list, press Map, and you'll switch to a map view, with the chosen hotel as a blinking icon. Double-click the icon, and a text box displays a review, complete with a numerical rating of service, rooms, and dining as well as an overall rating.

At the start of the sixth and final round—restaurants—I held just a one-point lead. But I felt confident: I'd spent many years in New York eating out as often as my wallet would permit. *Zagat* handles restaurants essentially the same way it does hotels. A dialog box lets you list criteria—price range, location, type of cuisine, special features ("delivers," "fireplace," "quiet conversation"), and so on. Reviews are available for every restaurant listed—all 1063 of them. I skimmed through about 25 write-ups for restaurants I knew and realized I was in trouble—the reviews were colorful, informative, and accurate in capturing each establishment's spirit. Plus, there were listings for hundreds of places I'd never been to and scores more I'd never even heard of.

I was despairing my title until I spotted *Zagat's* Achilles' heel. Sure, *Zagat* knew all the fashionable, pricey locales, but what about some of the more, well, bohemian spots? Where was Sweet Basil's (my favorite jazz hangout/bar), pizza standout V&T, the cheap and delicious Indian restaurants on East Sixth Street, or all those eccentric Village cafes?

In the end, *Zagat-Axxis* and I agreed to call it a tie. I must say I was impressed by the volume of *Zagat's* information. Maybe it's time for me to retire . . . and buy a color laptop.

—Steve Fox



ZAGAT-AXXIS CITYGUIDE: NEW YORK helps find the right restaurant for every situation, then shows you how to get there.

costs $99; information on additional cities costs about $25 per city.

If you're worried about getting there on time, the $299.95 *Personal Travel Guide* from Personal Travel Technologies lets you plan travel by bus, train, subway, streetcar, or foot. In the future, the product will even link with intelligent traffic monitoring systems to route you around traffic snarls. Customer contacts (imported as ASCII files) can be added for reference. So far, plug-in destination database modules at $149.95 have been compiled for San Francisco, Chicago, Miami, Orlando, New Orleans, and Sacramento. They include electronic yellow pages for hotels, entertainment, and weather and information on where you'll find a fax machine or an ATM.

Quick access to this kind of information can be more than just convenient. Scott Ahlsmith, president of Trava, a travel agency in Glen Ellyn, Illinois, uses IntraCorp's *Travel Partner* to set his business apart from the 29,000 other U.S. travel agencies. He uses it as an "in-house concierge" to find restaurants, hotels, and other services for clients traveling to distant cities. By pointing and clicking to locations around the world, Ahlsmith views directories of local information—hotels, airlines, points of interest—complete with phone and fax numbers, costs, and amenities. He then prints the information and includes it with his client's airline ticket. "Any agent can give them a hotel or rental car. I'm offering a one-of-a-kind service," says Ahlsmith.

A Competitive Tool

Analytical mapping programs focus on navigating data rather than thoroughfares. Nearly all these programs can crunch huge databases of demographic information that is available from either the Census Bureau or third-party vendors. Combine that with data specific to your business, and you have a powerful tool for scouting new markets or flagging problem areas.

Most of these packages offer database-like querying, delivering query results as map overlays. Say you're working with census information on family income to determine where to open a new upscale retail outlet. Typically, you'd select colors to represent ranges—say, green to show city blocks with families averaging incomes of over $80,000, blue to show those with incomes between $50,000 and $80,000, and so on. You could then superimpose addresses of competitors' stores to determine the best potential locations for your new outlet.

Easy to See What's Happening Where

Ken Swisher, a manufacturer's representative for Spraying Systems, a spray nozzle manufacturer in Randolph, New Jersey, uses *MapLinx Pro for Windows* with his contact manager *ACT for Windows* to track his customers. If he's planning a sales call in Connecticut, for instance, he types the cus-

Navigation and Travel

● = Yes ○ = No
n/a = not applicable

Company	Product	Price	MAPS: U.S. highways	MAPS: U.S. towns	MAPS: U.S. cities	MAPS: Foreign countries	MAPS: Foreign cities	SEARCH BY: Place name	SEARCH BY: Address	SEARCH BY: ZIP code	SEARCH BY: Area code	SEARCH BY: Phonetic searching	INFORMATION: Hotels	INFORMATION: Restaurants
Adept Computer Solutions 800/578-6277	Street Wizard W	$99	●	●	●	○	○	●	●	○	○	●	○	○
Automap 602/893-2400	Automap for Windows W	$99.75	●	●	●	●	●	●	○	○	○	●	●	○
Axxis Software 800/394-3549	Zagat-Axxis CityGuide	$99 per city, $249 for three cities	●	●	●	○	○	●	●	○	○	●	●	●
Brøderbund Software 800/521-6263	PC Globe W	$59.95	○	○	○	●	●	●	○	○	○	●	○	○
DeLorme Mapping 207/865-1234	Street Atlas USA	$169	●	●	●	○	○	●	●	●	●	●	○	○
IntraCorp 800/468-7226	Travel Partner	$79.95	○	○	●	○	○	●	○	○	○	○	●	●
Personal Travel Technologies 516/877-1234	Personal Travel Guide	$299.95	○	●	●	○	○	●	●	○	○	●	●	●
Road Scholar 713/266-7623	City Streets (formerly PC Maps)	$99.95[1]	●	○	●	●	●	●	●	●	○	●	○	○
SoftKey Software Products 800/377-6567	Key Map W	$59.95	●	○	●	○	○	●	●	○	○	●	○	○
Strategic Mapping 408/970-9600	Local Expert	$99[1]	●	○	●	●	●	●	●	●	●	○	●	●
The Software Toolworks 415/883-3000	Travel Companion	$79	○	○	●	○	○	●	●	○	○	○	●	●
	U.S. Atlas With Automap W	$99.95	●	●	●	○	○	●	○	○	○	○	○	○
	World Atlas W	$79.95 ($99.95 on CD ROM)	●	●	●	●	●	●	○	○	○	○	○	○

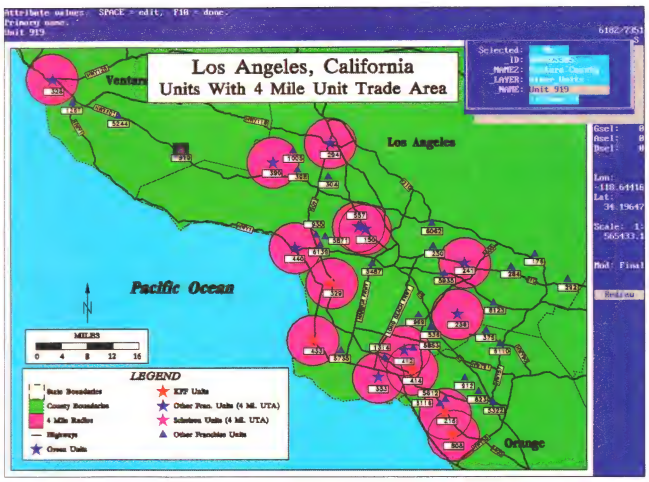
W Windows product

[1] One city free (user's choice).

tomer's name into *MapLinx*. *MapLinx* searches in *ACT* for information on the customer and displays the location on the map. To make the best use of his time in the area, he draws a circle around the location to spot customers nearby. His customers are coded A, B, C, or D by their sales volumes. "If I see three 'A' customers in my circle, I'll try to see them all. If I don't see any, I may widen the circle a bit or look at the 'B' listings," explains Swisher.

Integrating data with maps is an efficient and convincing way to present information as well as analyze it. Wayne Young, a project director with the Marine Board of the National Research Council (NRC) in Washington, D.C., the executive arm of the National Academy of Sciences, uses Golden Software's *MapViewer* in order to quickly create detailed maps of marine accidents. He can assign different symbols to types of accidents so it's immediately obvious what kind of accidents are happening and where. He uses these maps for in-house meetings and when he's making presentations at international conferences on marine safety. According to Young, the colorful maps make the key data "jump right off the page and beg for attention."

Mark Carpenter, a marketing analyst for Michigan Bulb, a mail-order company in Grand Rapids, has made geographic analysis an integral part of his job. "Even though we're a horticulture firm, we need to be a savvy marketing company," says Carpenter. "We need to know where to sell our products and when to send out catalogs." He uses a $995 package, *MapInfo for Windows,* to break the country into seasonal planting zones. As each zone approaches the right planting season, Michigan Bulb mails out the appropriate catalog. The maps take advantage of color and fill capabilities to help planners in Carpenter's department spot areas that are too cold, hot, or dry for their products. "I used to spend 80 to 100 hours defining mailing areas for catalogs. Using *MapInfo* for the first time, I planned a planting-zone mailing in 15 hours," Carpenter says. The same information used to be managed with a statistical and database program on a service bureau mainframe. He estimates that using *MapInfo* saves the company about $100,000 annually.



ARBY'S VIEWS PROTECTED TRADE AREAS WITH ATLAS GIS. The icons on this map represent Arby's franchises. The circles are protected areas. Arby's cannot plan any additional sites inside those circles.

Hal G. Reid, vice president of development research for Arby's, in Miami Beach, has a pair of urban geographers working with *Atlas GIS* to plan approximately 200 expansion sites per year for the 2600-store fast-food chain. "We used to make circles on road maps with crayons to show protected trade areas," says Reid. "You can imagine how we reacted anytime we had to make changes."

For companies willing to invest time and money, customizing the programs to suit their terminology and applications can help them gain an edge. Arby's has spent about $50,000 customizing *Atlas GIS* for national market analysis studies. The company uses the system to overlay demographic data from National Decision Systems and other sources on top of competitors' locations to develop a full demographics profile of every

	SYSTEM REQUIREMENTS											
Entertainment	Reviews	Pop-up information on areas	Interactive editing (personalized map information)	Displays route on map	Prints directions	Provides geopolitical information	RAM	Disk space	CD ROM drive required	Update schedule	Reader service number
	○	○	●	●	●	●	○	2MB	5MB	○	yearly	677
	○	○	●	○	●	●	○	512K	4MB	○	yearly	678
	●	●	●	●	●	●	○	2MB	5MB–9MB	○	yearly (planned)	679
	○	○	●	○	○	○	●	640K	3MB	○	yearly	680
	○	○	○	○	○	○	○	2MB	n/a	●	yearly (planned)	681
	●	○	○	○	○	○	○	640K	3MB	○	yearly	682
	●	●	●	●	●	●	●	4MB	4MB–8MB	○	quarterly	683
	○	○	●	●	○	○	○	640K	2MB–12MB	○	monthly (planned)	684
	○	○	●	●	●	●	○	640K	5MB	○	semi-annually	685
	●	●	●	●	○	●	○	500K	750K per city	○	monthly	686
	●	●	●	●	○	○	○	640K	2.5MB–3MB	○	yearly	687
	○	○	●	●	●	●	●	640K	4MB	●	yearly	687
	○	○	●	○	○	○	●	2MB	5.7MB	○	yearly	687

For more information about all products in this table, circle reader service no. 905.

proposed franchise site. "The maps are like a backdrop—we can add the data we want to view and remove what we don't need," says Reid. Arby's believes the expense of developing and supporting the *Atlas GIS*-based mapping system is justified, even necessary, to keep up with McDonalds, which has spent millions developing its own mapping system.

CIGNA, an integrated financial services company, uses *Atlas GIS* to market health insurance to large corporations. It develops customized proposals that show where a customer's employees live in relation to CIGNA's network of providers—a big selling point.

These maps even break down providers by specialty to show where the OB/GYNs or pediatricians are located, says Jennifer Fisk, assistant director at CIGNA's Employee Benefits Division in Bloomfield, Connecticut. "The maps help sell our services. They are easy to understand, and they also convey lots of information," she says.

Mapping the Future

The three biggest developers of analytical mapping tools—Environmental Systems Research Institute (ESRI), Strategic Mapping, and MapInfo—are stepping up efforts to reach the general business user. ESRI is best known for its high-end tool *PC Arc-Info*. But new ESRI products like *ArcView*

Competitive Tools

● = Yes ○ = No
n/a = not applicable

Manufacturer	Product	Price	MAPS: United States	MAPS: State boundaries	MAPS: County boundaries	SEARCH BY: Place name	SEARCH BY: Street address	SEARCH BY: Street intersections	SEARCH BY: Area code	SEARCH BY: ZIP code	DISPLAY: Symbol size indicates volume	DISPLAY: Area fill maps	DISPLAY: Dot-density maps	DISPLAY: Pie charts
3CS Software 312/271-1020	NCompass for Windows W	$149	●	●	●	●	●	○	○	○	●	●	○	○
Axys Software 604/656-1922	QuikMap W	$895	●	●	○	●	●	●	●	●	●	●	○	○
Caliper 617/527-4700	GisPlus	$2995	●	●	●	●	●	●	○	●	●	●	○	●
	TransCAD	$2995 and up	●	●	●	●	●	●	○	●	●	●	○	●
DeLorme Mapping 207/865-1234	MapExpert W	$495	●	●	○	●	●	○	●	●	○	●	○	○
	XMap Professional for Windows W	$4995	●	●	○	●	●	○	●	●	●	○	○	○
ESRI 909/793-2853	ArcView for Windows W	$495	○	○	○	●	●	●	●	●	●	●	○	○
	PC Arc-Info	$1495 and up	●	●	○	●	●	●	●	●	●	●	●	●
GeoVision 404/448-8224	StatMap III for Windows W	$595	●	●	○	●	●	○	○	●	○	●	●	○[8]
	Windows/On the World	$595	●	●	●	●	○	○	○	○	●	●	○	○
Golden Software 303/279-1021	MapViewer W	$249	●	●	●	○	○	○	○	○	●	●	●	●
Horizons Technology 800/828-3808	SureMaps	$349	●	○	○	●	○	○	●	●	●	○	●	○
Intera Tydac Technologies 613/226-5525	Spans Map W	$995	●	●	●	●	●	●	●	●	●	●	●	●
Klynas Engineering 805/529-1717	Streets On a Disk	$225[13]	○	○	○	●	●	●	●	●	●	○	●	○
Kositzky & Associates 405/692-1683	Geo Whiz	$130	●	●	○	●	○	○	●	●	●	○	○	○
MapInfo 518/274-6000	MapInfo for Windows W	$995	●	●	○	●	○	●	●	●	●	●	●	●
MapLinx 214/231-1400	MapLinx W	$149	●	●	●	●	○	○	●	●	○	●	●	○
	MapLinx Pro W	$399	●	●	●	●	○	○	●	●	○	●	●	○
RDS Systems 301/990-6277	M.A.P.S.[16]	$495	●	○	○	○	○	○	○	○	●	○	○	○
Strategic Mapping 408/970-9600	Atlas GIS	$2595	●	●	●	●	●	●	●	●	●	●	●	○
	Atlas MapMaker W	$395	●	●	●	●	○	○	●	●	●	●	●	●
	Atlas Pro	$795	●	●	●	●	●	●	●	●	●	●	●	○
Tactics Int'l, Ltd. 508/475-4475	Basic Tactician W[19]	$2495	●	●	●	●	●	●	●	●	●	●	●	●
WordTech Systems 510/254-0900	MapPlan	$499	●	●	●	●	○	○	●	●	●	●	○	●
	MapPlan for Windows W	$599	●	●	●	●	○	○	●	●	●	●	○	●

W Windows product

[1] ASCII, dBASE, Lotus, Excel.

[2] ASCII, PIX, TIGER, DXF, Arc-Info, DBF, WK3, DGN, DCW.

[3] ASCII, DBF, DXF, DGN, PCX, HPGL, WK3, DGN.

[4] ASCII, Excel, SuperBase, DBF.

[5] Arc-Info, PC Arc-Info, dBASE, Sun/Raster.

[6] ATLAS, DIME, DLG, DXF, Etak, IGES, MOSS, TIGER, GRID (ESRI), ASCII, MIADS.

[7] ATLAS, DIME, DLG ,DXF, Etak, I GES, MOSS, TIGER, GRID (ESRI), ASCII, MIADS.

[8] Through interface with other products.

[9] TIGER, ASCII, Lotus, Excel, DBF.

[10] TIGER, Excel, DBF, DXF, ASCII.

[11] ASCII, WK1, SYLK, Excel XLS files.

[12] Lotus, dBASE, TIGER, ASCII.

II are easier to use, cheaper, and more flexible. Earlier versions of *ArcView* used only *PC Arc-Info* maps and data, but *ArcView II* will import *1-2-3*, *Excel*, and *dBASE* data and make interactive changes easily.

MapInfo and Strategic Mapping are focusing on several low-end products such as Strategic's *Local Expert*. "We learned a lot from developing GIS products; now we're learning more about what business users need to do—find clients, plan trips, analyze sales territories," says David Radoff, director of product marketing and public relations with Strategic Mapping.

Daratech predicts mapping programs will find their way to more and more desktops because of falling hardware prices and the availability of ready-to-use data from commercial and government sources. If the trend continues, it won't be long before software-based maps become a common way of viewing business information. These packages already offer small businesses the same competitive advantage of, say, Arby's or McDonalds. Just define your needs and price range—chances are there's a vendor out there who's already thinking along the same lines.

Laura Lang is a freelance writer based in San Diego. She is a contributing editor for Computer Graphics World *and* Government Technology Magazine.

				DEMOGRAPHIC DATA SOURCES									SYSTEM REQUIREMENTS			
Includes ZIP code boundaries	Includes topographical maps	Includes DBMS	Automatic routing	U.S. cities	U.S. states or counties	Overseas	1990 Census	Other	Data update schedule	More data available from vendor	Import file format	Export file format	RAM	Disk space required	CD ROM drive	Reader service number
○	○	●	○	○	○	○	●	○	10 years	●	Paradox, ASCII	Paradox, ASCII	2MB	3MB–5MB	○	759
○	○	○	○	○	○	○	n/a	n/a	n/a	●	[1]	DXF, HPGL, PCX	640K	5MB	○	800
○	○	●	●	●	●	○	●	n/a	n/a	●	[2]	[3]	640K	22MB	○	801
○	○	●	●	●	●	○	●	n/a	n/a	●	[2]	[3]	640K	2MB	○	801
○	○	○	○	○	○	○	n/a	n/a	n/a	●	none	none	2MB	3MB	●	802
○	●	●	○	○	○	○	n/a	n/a	n/a	●	[4]	ASCII	2MB	4MB	●	802
○	○	○	○	○	○	○	○	○	varies	●	[5]	dBASE	4MB	12MB	○	803
○	○	○	●	○	○	○	○	○	varies	●	[6]	[7]	640K	40MB	○	803
○	○	○	○	○	●	○	●	○	n/a	●	[9]	[10]	2MB	2MB	○	804
○	●	●	○	○	○	○	n/a	n/a	n/a	●	DLG, ASCII	DXF	2MB	2MB	●	804
○	○	○	○	●	●	●	○	●	yearly	●	[11]	ASCII, SYLK	2MB	2MB	○	805
○	●	●	○	●	●	○	○	●	yearly	●	n/a	ASCII	4MB	6MB	○	806
○	○	●	○	●	●	○	●	●	n/a	●	[12]	Lotus, dBASE, ASCII	4MB	6MB	○	807
○	○	●	●	○	○	○	●	●	3 years	●	ASCII	ASCII	500K	up to 20MB	○	808
○	○	○	○	○	○	○	○	○	n/a	●	ASCII	ASCII	640K	6MB	○	809
○	○	●	○	●	●	●	●	●	yearly	●	[14]	DBF, ASCII	4MB	4MB–8MB	○	810
○	○	○	○	○	●	○	●	●	varies	●	DBF, ASCII	[15]	2MB	5MB	○	811
●	○	○	○	○	●	○	●	●	varies	●	DBF, ASCII	[15]	4MB	12.5MB	○	811
○	○	○	○	○	○	○	n/a	n/a	n/a	●	ASCII	ASCII	512K	up to 13MB	○	812
●	○	●	○	●	●	●	●	●	varies	●	[17]	[18]	640K	12MB	○	813
●	○	●	○	●	●	●	●	●	varies	●	[1]	[1]	1MB	5MB	○	813
●	○	●	○	●	●	●	●	●	varies	●	[17]	[18]	640K	10MB	○	813
○	○	●	○	○	●	○	●	●	yearly	●	[1]	ASCII	4MB	40MB	○	814
●	○	●	○	●	●	●	●	●	varies	●	DXF, DLG	CGM	640K	4MB	○	815
●	○	●	○	●	●	●	●	●	varies	●	DXF, DLG	[20]	2MB	4MB	○	815

[13] Maps $95 each per county.

[14] ASCII, DBF, Lotus, Excel.

[15] DBF, ACT!, other word processing formats.

[16] With World Data Bank 1.

[17] ASCII, dBASE, FoxBASE, Lotus, Excel, TIGER, Arc-Info, DXF, Etak, DLG.

[18] dBASE, ASCII, TIGER.

[19] DOS, Windows, and OS/2 versions.

[20] CGM, Windows Clipboard.

For more information about all products in this table, circle reader service no. 904.

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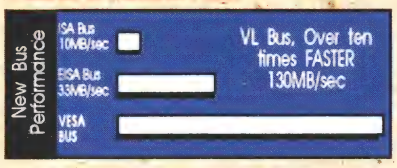

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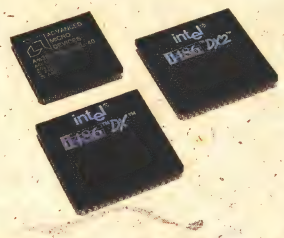

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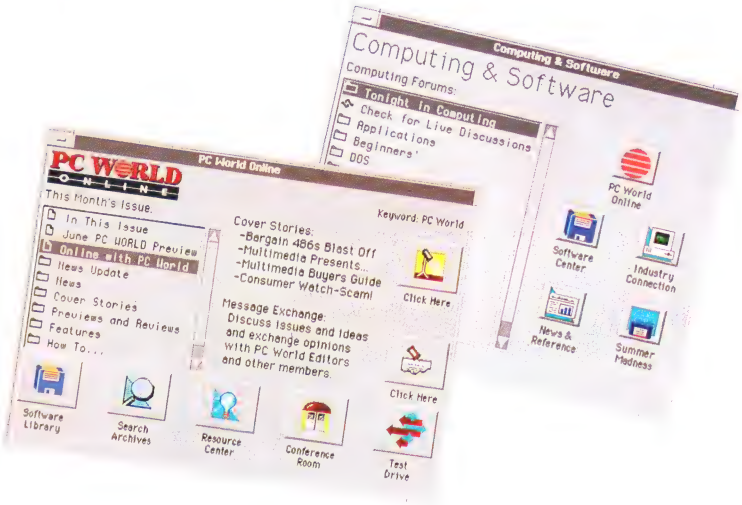

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Here's How

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HELP LINE Q&A

Tip of the Month

WALLPAPER WITH A PURPOSE: ***Windows'*** **wallpaper and screen-saver images can be fun; why not make them useful too? Instead of static 3-D chess pieces or a moving star field, display information you use every day—like the company phone directory.**

To create a wallpaper phone list, just call up Paintbrush, select the text ('abc') tool, pick a spot on the canvas, type the list, and save it as a BMP file in the *Windows* directory. Then in Control Panel, double-click Desktop, locate the Wallpaper section, and select your BMP image in the File list box. Click OK and you're done.

If your current wallpaper image is standard VGA but you run *Windows* at a higher resolution, your image doesn't take up the whole screen—it's tiled on the screen several times, or it's centered and surrounded by lots of blank space. In either case, you can combine your wallpaper image with your phone list—the best of both worlds. Just open a new Paintbrush file and paste in your current wallpaper image using Edit • Paste From, then enter your phone list around or alongside the image.

To create a screen-saver image, you need a program like *After Dark*. With *After Dark*'s Logo, Globe, and Slide modules, you can display the same BMP file in various ways; screen-saver fanatics can do even more by creating a graphics module.

Robert Luhn, contributing editor

Share Drives Between Two PCs

Q I own two 386s. To save money, I would like to buy an external tape backup drive and an external CD ROM drive and move them from one computer to the other. Is SCSI the best interface for this purpose?

Richard J. Farrell
Agoura Hills, California

A You could install a SCSI adapter in each PC, and move a single tape drive from one to the other—but it wouldn't save you money. Internal tape drives are cheaper than externals, and those that hook to floppy controllers cost less than SCSI models. An external SCSI tape drive will likely cost significantly more than *two* QIC-80 standard, 250MB internal drives.

If the two computers are in different locations, moving an external CD ROM drive between them will be cheaper than buying a second drive. External CD ROM drives cost only 10 to 20 percent more than internals, and a second interface board will add another $50 to $150 to the price.

If the two computers are in the same location, the cheapest approach is to buy one internal tape drive and one internal CD ROM drive and link the PCs with a peer-to-peer network, like Artisoft's *Lantastic* or Microsoft's *Windows for Workgroups*. That will let you share not only the tape and CD ROM drives, but hard disks and printers as well.

Install Old Memory in New DX2?

Q I own a 25-MHz 386 with 16MB of RAM and am planning to upgrade to a 50-MHz 486DX2 soon. A salesperson told me that if I want to use my current SIMMs in a new system, I would have to buy a 33-MHz 486DX instead, since my 70ns SIMMs are too slow: He says 50-MHz 486DX2 systems require 60ns. Is that true?

Eddie A. Gregg, Temple Hills, Maryland

A The salesperson you spoke with apparently assumed that because the DX2s in that store required 60ns SIMMs, they all do. In reality, DX2 systems' memory-speed requirements vary from 60ns down to 80ns. Buy a system that requires 70ns or slower and it will happily accept the RAM from your old system. A PC that demands 60ns memory *may* run a bit faster than one that uses 70ns chips, but system performance depends on the interaction of many different components (memory, cache, video, bus, disk), so there's no guarantee of that.

Copy, Move, and Delete by Date

Q Is there a DOS utility I can use to copy, move, and delete files modified before or after a particular date?

Ayman S. A. El-Sawaify, Honolulu

A You can use XCOPY to copy files based on when they were modified. For example, to copy files created on or after January 15, 1993, from the current directory to the directory C:\NEW, enter **XCOPY *.* C:\NEW /D:01-15-93** at the DOS prompt.

For the other tasks you describe, use DOS 5.0's Shell (enter **DOSSHELL** at the DOS prompt): Select the directory containing the files you want to act on, then select *Options • File Display Options •*

ILLUSTRATIONS: JAN BOER

Date•OK to sort the file display by date. Mark the beginning of the group of files you want to select by clicking on the first file with the mouse. Then scroll down to the last file you want to include, and **<Shift>**-click on it to select the whole group. (To use the keyboard instead of the mouse, select the first file, press **<Space>**, scroll down to the last file, and press **<Shift>-<Space>**.) Then select *File•Move, File•Copy,* or *File•Delete,* as appropriate.

Extra-Safe Storage

Q Would storing my floppy disk backups in a bank safe-deposit box assure the preservation and integrity of the disk contents?

Robert B. Dawson, Greenfield, Indiana

A A safe-deposit box is certainly one of the safest places you can store disks. It will protect the disks against most of the things that can damage them: heat, cold, dust, damp, and magnetic fields. The only things that could hurt them would be a disaster that destroyed the bank, or the unlikely event of someone storing a giant magnet in the next box. A good fire safe will afford the same level of protection.

However, it sounds like what you're really asking is, how can you make your backup data as safe as possible? There are a few more steps you should take to reach that goal. First, switch from floppy disks to tapes. Tapes are more rugged than disks. They're also faster to use and more convenient, so you'll be able to back up often with minimal interruption of your work. You can pick up a tape drive and a few tapes for as little as $200. (Watch for a tape drive buyers' guide in an upcoming issue.)

If a fire or other disaster destroys your office building, your data will be lost unless you've stored copies of your backup tapes off site. (A lot of companies in California learned that lesson the hard way after the 1989 earthquake, when they couldn't get into their offices for days or weeks pending safety inspections, or at all after their offices were condemned.) Your precautions can be as simple as having one person take a backup tape home (or to your safe-deposit box) once a week. Rotate among at least three tapes, so you need never risk having all three backups in the same place.

Tapes last a couple of years given normal use, but they won't last forever—and a worn-out tape can mean a partially or wholly unusable backup set. Mark the date of first use on the case with indelible ink, and replace old tapes regularly. New tapes are occasionally defective: If, when you format a tape, you find it has bad sectors, ask your dealer for a replacement. If that's a persistent problem, try another brand.

Switching Between Two Programs

Q What is the simplest DOS program we can use to switch between *Quattro Pro* and *WordPerfect* without having to exit each one every time? (We don't have *Windows* or OS/2 and don't want them.) Also, when I save *Quattro Pro* graphs in HP plotter format and import them into *WordPerfect,* they don't always print as well on our LaserJet II as they do directly from *Quattro Pro.* Is there some way to fix that?

Nicholas S. Lamont, New York

A If you've got DOS 5.0, you already have a utility you can use to switch between *Quattro Pro* and *WordPerfect* without exiting: the MS-DOS Shell. Enter **DOSSHELL** at the DOS prompt to start the Shell.

First, look on the *Options* menu. Select *Enable Task Swapper* to turn the option on if there's no dot next to it. Then select *View•Program List* (or *View•Program/File Lists*).

Now create a Program List entry for *WordPerfect:* If Main is not the active window (if its title bar is not highlighted), **<Tab>** to it or click inside it. Select *File•New•Program Item•OK.* Type **WordPerfect**, press **<Tab>**, type the DOS command you use to start *WordPerfect,* press **<Tab>**, type the directory in which you store your *WordPerfect* files (or **C:** if

USER GROUP OF THE MONTH

Pasadena IBM Users Group

The March *User Group Tips* come from the Pasadena IBM Users Group. PIBMUG publishes a monthly newsletter and maintains a multiline electronic BBS with an on-line technical support listing. The group's monthly meetings are open to the public. PIBMUG offers special interest groups for novices as well as for users interested in *Windows,* spreadsheets, word processors, databases, programming languages, and desktop publishing.

For more information, contact Steve Bass at 711 E. Walnut St. #306, Pasadena, CA 91101; 818/795-2300. Fees are $5 per meeting or $48 per year; family memberships cost $90.

Reader service no. 636

SAFER INSTALLATIONS: In the past, whenever I upgraded my software I'd install it into the directory where the old program resided. Then I received some bug-infested upgrades. Once I'd installed the new version over the old, retrieving the original turned into a nightmare. What's worse, some products translated the old version's data files into a new format, which meant there was no going back.

These days I'm more careful. I always install the new software into a new subdirectory and keep my old version intact. Once I'm sure the new one is stable, I delete the old directory. If I'm running short on disk space, I use *PKZIP* to compress the old program and a copy of the data files for easy retrieval.

Rod Ream
Pasadena IBM Users Group

there's no special directory), press **<Tab>**, press **<Ctrl>-<Alt>-W**, press **<Tab>**, and press **<Space>**. The result should look something like Figure 1. Now press **<Tab>** twice and **<Enter>** once to save the Program Item. Repeat the process to define a Program Item for *Quattro Pro*, making its shortcut key **<Ctrl>-<Alt>-Q**.

Now you'll have Program List entries for both programs. Highlight *WordPerfect* and press **<Enter>** to start it. Once the program has loaded, press **<Ctrl>-<Esc>** to return to the Shell. Highlight *Quattro Pro* and press **<Enter>**. Now you can switch quickly between the two programs by using the shortcut keys you defined (**<Ctrl>-<Alt>-W** and **<Ctrl>-<Alt>-Q**).

If you don't have DOS 5.0, any third-party task switcher will do the same thing. Following is a list of several of the most popular. In your case, I'd strongly recommend *WordPerfect Office*. Its shell utility makes copying data between programs particularly easy by hooking directly into *WordPerfect*'s copy/paste buffer. (Note that *Office*'s shell utility is also bundled with several of WordPerfect Corporation's non–word processing programs.)

As for your problems printing *Quattro Pro* graphs from *WordPerfect*, you may get better results if you save the graphs in PCX or PIC format instead of HP-GL. (The EPS format would be your best choice if you had a PostScript printer, but it won't work with your LaserJet.) You can also experiment with the Invert command (Graphics•Figure•Edit•Edit•Invert) in *WordPerfect*'s graphics editing menu.

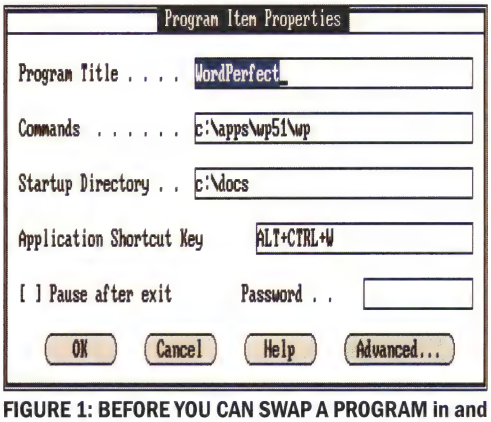

FIGURE 1: BEFORE YOU CAN SWAP A PROGRAM in and out of memory with the MS-DOS Shell's task swapper, you need to add it to the Program List.

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  Reader service no. 637
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- **DR DOS 6.0** $99; Digital Research Inc.; 800/638-9273, 408/321-1198, 408/649-8209 (fax)
  Reader service no. 639
- **PC Tools** $179; Central Point Software; 800/443-4208, 503/690-8090, 503/690-8083 (fax)
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- **Software Carousel** $90; SoftLogic Solutions, Inc.; 800/272-9900, 603/627-9900, 603/627-9610 (fax)
  Reader service no. 641
- **Switch-It** $99.95; Better Software Technology, Inc.; 800/848-0286, 508/879-0744, 508/872-1734 (fax)
  Reader service no. 642
- **WordPerfect Office** $149; WordPerfect Corp.; 800/451-5151, 801/225-5000, 801/222-5077 (fax)
  Reader service no. 643

For more information about all products in this section, circle reader service no. 906.

DOS Redirection Characters

Q To keep a record of when my office's shared computer is turned on, I added the commands DATE < CR.DAT >> BOOT.LOG and TIME < CR.DAT >> BOOT.LOG to AUTOEXEC.BAT. The CR.DAT file contains only the single carriage return the DATE and TIME commands require. My problem is that other users keep deleting CR.DAT, after which these commands produce only a 'File not found' message and don't update the BOOT.LOG file. Can I send these commands a carriage return from within the batch file itself?

Jianhong Wang
Guelph, Ontario, Canada

A Yes, but first let's give a little background to the uninitiated. The < and >> in the commands above are redirection characters. The *command* < *filename* construct tells DOS to feed the characters in the specified file to the command in the place of input that would normally come from the keyboard. The >> *filename* portion tells DOS to take the command's output that would normally go to the screen and append it to the specified file (the file is created if it doesn't already exist).

A third redirection symbol, >, not used by Mr. Wang's commands, tells DOS to replace, instead of add to, the specified file's contents. For example, DIR A: > C:\DIRFILE replaces the contents of C:\DIRFILE with output that DIR A: would normally display on screen. You can also use > to redirect a command's screen output to a printer, as in DIR A: > LPT1.

The fourth redirection character, the pipe (|), lets you use the output of one command as input for another. For example, TREE C:\ | MORE "pipes" the output of TREE C:\ (the directory tree structure of drive C:) to the MORE command, which displays a screenful of its input and waits for you to press a key before displaying the next screenful.

To solve your problem, use the command ECHO. (no space before the period) to generate the carriage return and | to pass the carriage return to the DATE and TIME commands. Modify the commands in AUTOEXEC.BAT to **ECHO.| DATE >> BOOT.LOG** and **ECHO.| TIME >> BOOT.LOG**.

This trick also works with many other commands. But if a command clears the keyboard buffer before executing, you need your old < CR.DAT trick instead. In such cases, you can ensure that CR.DAT exists by adding the command **ECHO.> CR.DAT** to your batch file *before* the first occurrence of < CR.DAT.

By Robert Lauriston

Robert Lauriston is a contributing editor for PC World.

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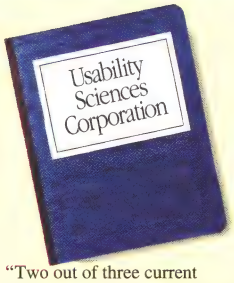

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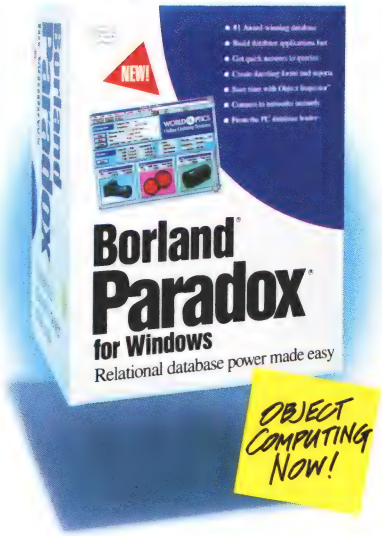

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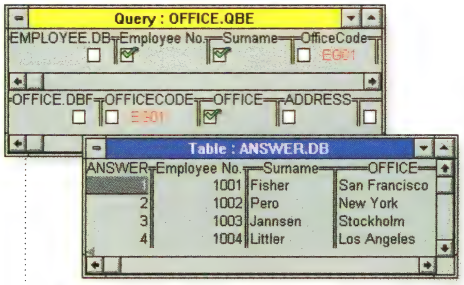

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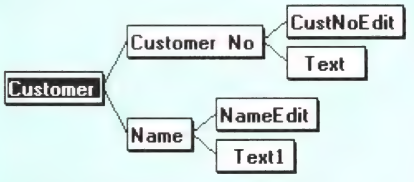
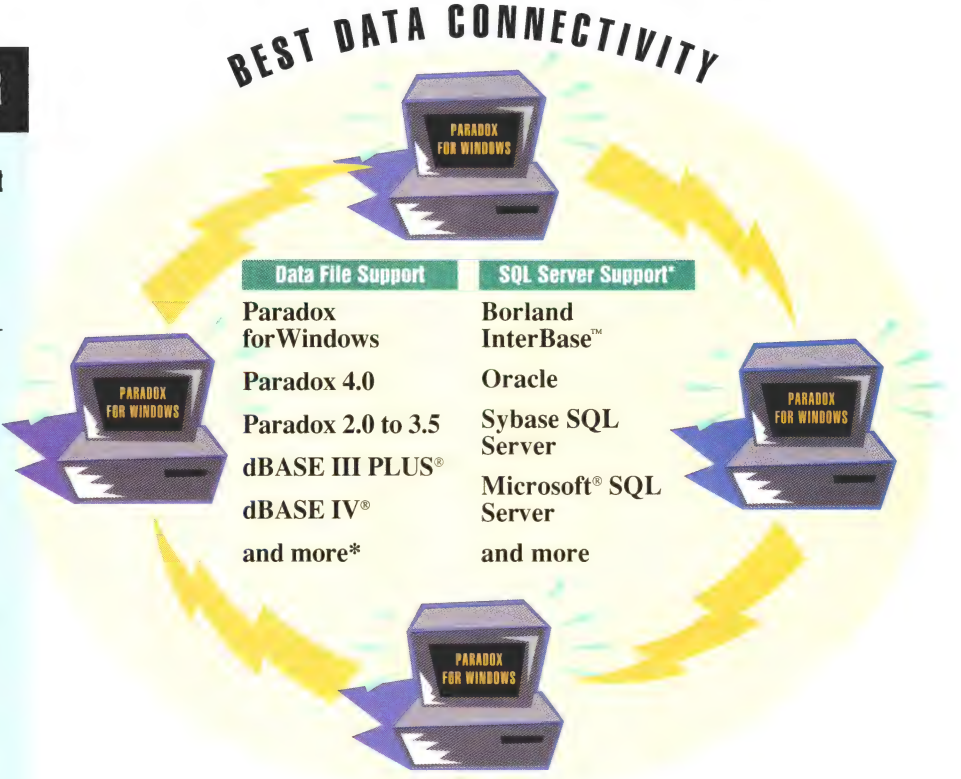


▲ *Paradox for Windows' Object Tree helps you build graphical applications fast.*



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Paradox is the best Windows database

USABILITY	Paradox	Access
Insert 1,000 records†	29 sec	147 sec
Range select: 15,000 of 130,000 records†	<1 sec	16 sec
Graphical form and report design tools	●	●
Graphical Query By Example	●	●
Object inspection menus with right mouse button	●	
Visual data modeling for forms, reports, and queries	●	
Full edit capabilities in multi-table forms	●	
Built-in data types: graphic, formatted memo, binary large objects	●	
DATA CONNECTIVITY		
Full native support for Paradox and dBASE tables	●	
Direct creation of Paradox and dBASE tables	●	

DATA CONNECTIVITY, *continued*	Paradox	Access
Unlimited secondary indexing	●	
Creation of dBASE field and expression indexes	●	
Cascading updates in referential integrity	●	
SAG CLI-compliant middleware connectivity built-in	●	●
Table encryption and security	●	●
Paradox 4.0 and dBASE IV multiuser concurrency	●	
APPLICATION DEVELOPMENT		
Event-driven programming	●	●
Object-oriented development environment	●	
Programming Productivity Switch	●	
Graphical object management tools	●	
Database-specific programming language	●	

nections to an unprecedented array of data types. You can work with text, numbers, and unlimited length memo fields, complete with graphical attributes like font, size, color, and style. Or work with graphic fields that contain bitmapped pictures, OLE fields that store objects from other Windows applications like spreadsheets and word processors, and even Binary Large Object (BLOb™) fields, which can include multimedia objects, digitized sound, CAD drawings, and more.

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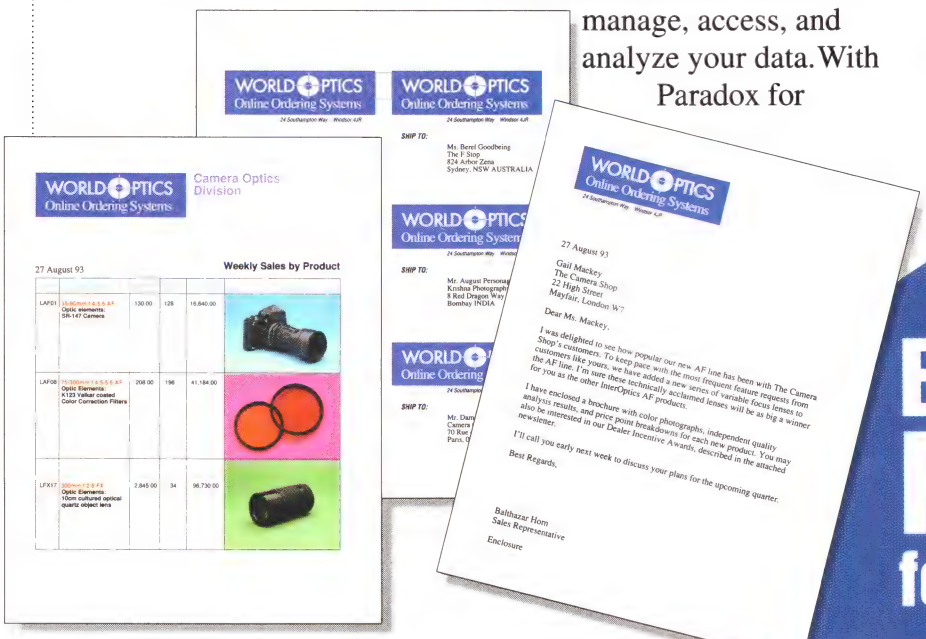

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SPREADSHEETS Q & A

Drawing the Line in Excel

Q As a *1-2-3* user, I used right-aligned minus and equal signs to create total lines in financial reports. When I switched to *Excel*, I looked forward to eliminating the little spaces between the characters. But I can't get *Excel* to produce satisfactory lines: While the Format•Border command puts lines at the bottom of the cell, it always fills the width of the column. How can I get a solid double or single line that's slightly narrower than the cell?
Jeff Lamond, Exeter, Ontario, Canada

A The quick-and-dirty solution is to format several right-aligned spaces as underlined and/or strikeover (use Format•Font). But the best approach I've found is to use *Excel*'s drawing tools to place lines on the bottom edge of the cell. Start by revealing the draw toolbar: Select *Options•Toolbars*, select the *Drawing* toolbar, and click *Show*. Now, click the line tool, press and hold the **<Alt>** key, and drag along the bottom of the cell to draw a line.

For a double line, copy the first line: Press **<Ctrl>-C**, then press **<Ctrl>-V**. Place the mouse pointer on the line, and when it becomes an arrowhead, press the **<Shift>** key and drag the duplicate line down just a smidgen. Select both lines—press **<Ctrl>** and click on the other line—and join them into a single object by clicking the group button or selecting *Format•Group*.

Now, shorten the line slightly: Depress the **<Shift>** key, and drag the selection mark on the left edge of the line slightly to the right. Make sure that the line is attached to its cell: Right-click on the line, and when a pop-up menu appears, select *Object Properties;* in the dialog box, ensure that *Move and Size with Cells* is selected. Now, when you change the width of the column, the line will adjust automatically.

That's a lot of work for just one line. But now that you have one, you can quickly copy it: Select it with the mouse, press **<Ctrl>-C**, press **<Ctrl>-V**, then press the **<Alt>** key and drag the copy to another cell.

Hidden Sums in 1-2-3

Q I need a formula that hides zeros for quarterly data until the quarter is complete. I'm comfortable with a formula like @IF(B1<1 #OR#B2<1# OR#B3<1, "", @SUM(B1..B3)). If any cells are empty, the formula displays nothing; when they're all full, it displays their sum. But I want the formula to work even if one of the values is supposed to be zero. Please tell me how.
John Ryan, Fountain Valley, California

A How about using this formula: @IF(@COUNT(B1..B3)=@ROWS(B1..B3),@SUM(B1..B3),"")? @ROWS() yields the number of cells in the range, and @COUNT gives the number that have entries. If the numbers are the same, the formula displays the sum; otherwise it displays nothing. Of course, you could use a constant (in this case, 3) in place of the @ROWS() function, but the function allows the formula to adjust gracefully when you insert rows into the range. For a larger range, you could use something like @ROWS(B1..D4) * @COLS(B1..D4) to calculate the number of cells in the range.

Excel, Novell, Crosstabs, Kaboom!

Q We run *Excel 4.0* on a Novell network, and until last week we thought everything was going smoothly. When one of our users tried to use the Crosstabs feature, she was greeted with an error message instead of a Crosstabs table. Crosstabs works fine on a standalone system, but we don't want to install *Excel* locally on all our users' machines if we can help it. Is there a fix?
Will Herder, Rosemont, New Jersey

A Microsoft issued a maintenance release of *Excel, 4.0a,* in late October to remedy several bugs, including this one. Call the company's technical support line to obtain a copy. The problem arises when Crosstabs tries to write a temporary file to the CROSSTAB directory, to which users are usually denied rights. For example, let's say you've installed *Excel* in the directory X:\APPS\EXCEL. Then the Crosstabs add-in will be in X:\APPS\EXCEL\LIBRARY\CROSSTAB. Until *4.0a* arrives, just assign all *Excel* users full rights to this directory, including Create, Erase, File Scan, Modify, Read, and Write.

One Lookup, Many Files

Q I read your October column about lookup functions with great interest. I want to use @VLOOKUP functions in

Spreadsheet Toolbox

Financial analysts who work with spreadsheets often require specialized calculations that go far beyond the routine financial functions supplied with *1-2-3, Quattro Pro,* or even *Excel 4.0.* No matter which spreadsheet you use, you can stop laboring over complex formulas or intricate macros and simply order a copy of *@nalyst,* an add-in library of dozens of functions to meet your special needs.

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my *1-2-3* worksheets to look up items from a single reference file into various worksheets (instead of putting the lookup table into every worksheet), but I can't get the formula to work.
Joel Grossman
New Rochelle, New York

A In *1-2-3* release 3.*x*, the formula would look like @VLOOKUP(A1,<<C:\LOOKTABL.WK3>>A1..D10,1), assuming that the item you want to look up is in A1 and your lookup table is in the range A1..D10 in the file C:\LOOKTABL.WK3. Note that this trick will not work in *1-2-3 2*.x, which can't use external cell references in functions or calculations. In *Quattro Pro*, the formula is @VLOOKUP(A1,[C:\LOOKTABL .WQ1]A1..D10,1); in *Excel*, =VLOOKUP(A1,C:\LOOKTABL.XLS!A1..D10,1).

Printing Ranges Side by Side

Q Using *1-2-3 3.1*, I need to print a 3-D range as a single table. When I designate A:B1..C:B5 as the print range, the values from each sheet appear below the values from the previous sheet. That is, I get A:B1..A:B5 first, then B:B1..B:B5 below it, and so on. Is there any way to print them side by side?
Subash Deodhar, Vernon Hills, Illinois

A Here's one way: Let's say your tables are set up as shown in Figure 1. Put the cell pointer on A:B1, and select */Range•Transpose*. Use the arrow keys and **<Ctrl>-<Page Up>** to select A:B1..C:B5, and press **<Enter>**. Then put the cell pointer on A:D1, and select *Columns/Worksheets*. You end up with a copy of the range, with the sheets arranged in columns, as shown, and with formulas replaced by their values. Use this copy as your print range. If you use a macro to print the report, it's a simple matter to incorporate this routine into it.

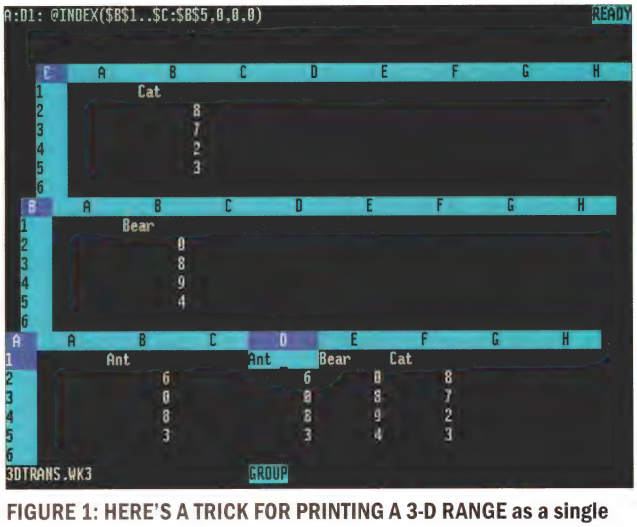

FIGURE 1: HERE'S A TRICK FOR PRINTING A 3-D RANGE as a single table with the columns arranged side by side.

This approach is quick and easy, but if the table values have changed, you have to repeat the command before you can print the report. If you want a live table that updates each time you alter a value, set up a table of formulas like the one shown. Enter **@INDEX($A:$B$1..$C:$B$5,0,0,0)** into D1, and copy it to D1..F5. The @INDEX function will pick a value from the range $A:$B$1..$C:$B$5 based on its column, row, and sheet position; the dollar signs ensure that the range reference remains the same in all the copies. Initially, every cell in the table will contain the word *Ant* from cell A:B1 of the table. Now edit the copies to change the row, column, and sheet offsets to look up the other values from the table: In column E, change the fourth argument in all the formulas to 1 to get values from the second sheet in the table; in column F, change it to 2. For instance, F1 should read **@INDEX($A:$B$1..$C:$B$5,0,0,2)**. On the second row of the table, change the third argument in each formula to 1; on the third row, change it to 2. Continue to repeat this pattern throughout the remainder of the formulas; cell F5 should be **@INDEX($A:$B$1..$C:$B$5,0,4,2)**. This table is a pain to set up, but you might find it well worth the trouble.

Speedy Calculations With Tables

Q I've developed a spreadsheet to handle a hockey pool in my office, but I want to find a faster way to do the calculations. I need to assign 10 points if a participant correctly predicts a team's score, 7 if he or she misses by 1, 5 if by 2, and so on. There are 24 teams, with 160 to 200 participants, and each cell contains a formula like @IF(B1=B3,10,@IF(B1=B3+1,7,@IF(B1=B3-1,7,@IF(B1=B3+2,5,@IF(B1=B3-2,5,@IF(B1=B3+3,3,@IF(B1=B3-3,3,@IF(B1=B3+4,1,@IF(B1=B3-4,1,0))))))))), where the participant's guess is in B1 and the team score is in B3.

With over 5000 copies of this formula, the worksheet is huge and very slow. Isn't there a faster way to calculate?
Eboli Febrin
Pine City, Texas

A You can definitely improve the formulas by using a lookup table and the @ABS function; you could also use a Data Table to avoid storing thousands of formulas. Figure 2 shows how it might work. Check out the formula in B5: @VLOOKUP(@ABS(B3-B1),B9..C14,1). B3-B1 calculates the difference between each participant's guess and the actual score; @ABS turns a negative difference into a positive number. The lookup table at B9..C14 converts the differences into points. When the

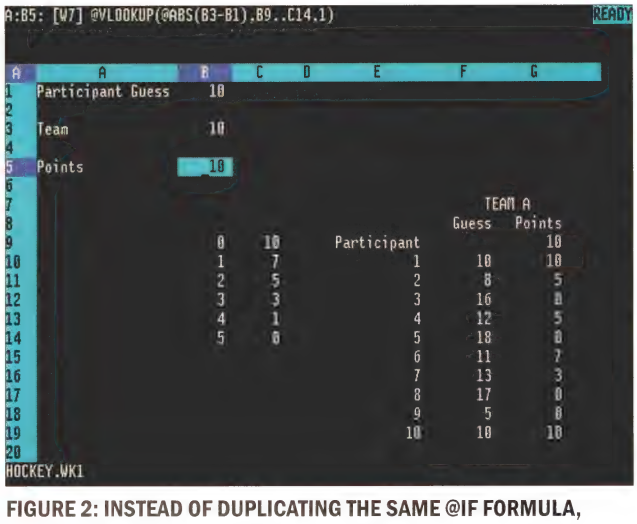

FIGURE 2: INSTEAD OF DUPLICATING THE SAME @IF FORMULA, improve performance by using a lookup table.

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difference is zero, the lookup function returns the 10 from the top row; when the difference is 5 or greater, it returns the zero from cell C14.

Now, with 5000 copies of this formula you will still have a sluggish worksheet, although these formulas will recalculate faster than your embedded @IF() formulas.

To further improve performance, you might want to set up each team as a one-way data table, like the one shown in E9..G19. For each participant, enter his or her guesses into F10..F19. In G9, enter the formula **+B5**. Select */Data • Table • 1*, paint the range *F9..G19*, and press **<Enter>**. Then select B1 as the Input cell, and press **<Enter>** again. *1-2-3* builds the table of points shown in G10..G19 by putting each guess from column F into cell B1, recalculating G9, and entering the result into the corresponding row in column G.

By Richard Scoville

Richard Scoville is a contributing editor for PC World *and a software training consultant based in Durham, North Carolina.*

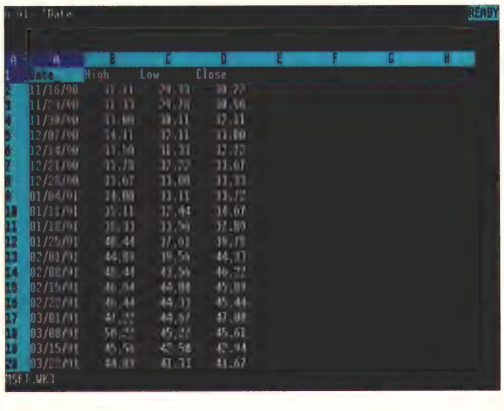
Mail your spreadsheet questions to Spreadsheets, PC World, *501 Second St. #600, San Francisco, CA 94107; or send them to Richard Scoville, CompuServe, 72341,2727; MCI Mail, 357-4517; or 415/442-1891 (fax).* PC World *pays $50 for published questions. Sorry, we cannot acknowledge unpublished materials.*

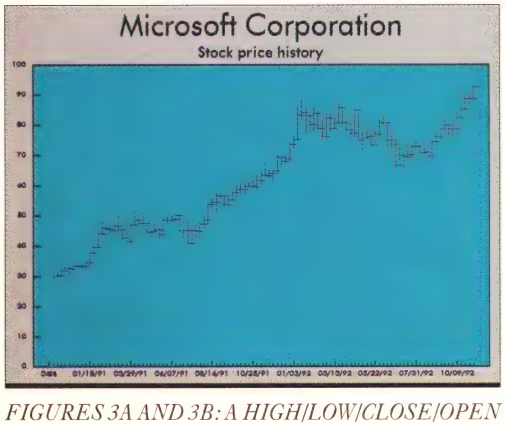
Master Class: Graph Attack

This month, Master Class responds to a question from Merton Bolack of Washington, D.C., who wants to know how to display downloaded stock data in a high/low/close/open chart in *1-2-3* release 3.1.

Just to satisfy my own curiosity, I decided to check out Microsoft's stock price history. I went to the Issue/Symbol Lookup forum on CompuServe (GO SYMBOLS) and found that Microsoft's stock symbol is MSFT. Then, from the Pricing History forum (GO PRICES), I downloaded Microsoft's weekly price data for the period from 11/16/90 to 11/16/92 into a text file I called MSFT.PRN.

Once you've downloaded the stock data, open a blank worksheet in *1-2-3* and import the text file: With the cell pointer on A1, select */File • Import • Text,* and choose MSFT.PRN. The data will appear in the spreadsheet as a series of long labels extending from A1 to A147. Each line contains the date, volume, and weekly high, low, and closing prices, each separated from the next by a few spaces.





FIGURES 3A AND 3B: A HIGH/LOW/CLOSE/OPEN chart can help you track fluctuations in stock prices.

The text file includes title information at the top and a blank line between every five records. Using the command */Worksheet • Delete • Row,* work your way down the sheet, deleting the superfluous rows. You'll end up with column headings in A1..A2 and data in A3..A106. To make the data more readable, I turn off the Wysiwyg interface with *:Display • Mode • Text.*

Next, you need to parse the single column of labels into separate columns of values and, for the prices, combine the integers and fractions into single values. Start with the cell pointer on the first data record (A3), and execute the command */Data • Parse • Format-Line • Create.* The format line controls where *1-2-3* will split the labels. Then select *Input-Column,* highlight A3..A107, and press <Enter>. Then choose *Output-Range* and select cell H4. Select *Go,* and *1-2-3* creates eight columns of values: date value, volume, high price integer, high price fraction, low price integer, low price fraction, closing price integer, and closing price fraction.

To combine the integer and fraction portions of the high, low, and closing prices, put the cell pointer in P4 and enter the formula +J4+K4; in Q4 enter +L4+M4; and in R4 enter +N4+O4. Next, copy P4..R4 into P5..R107. Then select */Range • Value,* paint P4..R107, and press <Enter> twice to convert the formulas into values. Finally, use */Worksheet • Delete • Column* to delete the original data in columns I..O (you won't need the volume data).

Use */Range • Format • Date • 4* and press <Enter> to format the date values in column H; then use */Range • Format • Fixed • 2* to format the numbers in column I, J, and K to show hundredths of a point. Finally, replace the original labels with the converted values by using */Move* to move I4..K107 to A4. Then edit the column headings, delete the data parse format row, and use *:Display • Mode • Graphics* to turn Wysiwyg back on. The finished table of data is shown in Figure 3A.

Finally, you're ready to create the graph shown in Figure 3B. Select */Graph • Group,* paint the range A1..D105, press <Enter>, and select *Columnwise*. Select *Type • HLCO* to get a high-low chart. Then, to display only every tenth label on the *x*-axis, select *Options • Scale • Skip* and enter 10. Use *Titles* to add appropriate titles, then *Quit* and *View* your creation.

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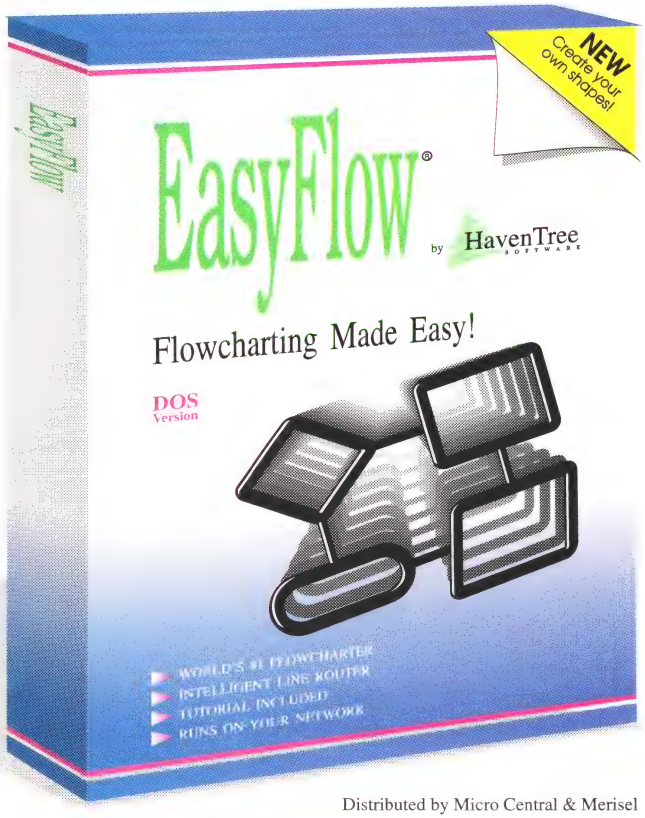

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WORD PROCESSING Q & A

Relocating Footnotes in WordPerfect

Q I need to move all the footnotes in an existing *WordPerfect 5.1* document from the bottom of each page to the end of the entire document. This is very tedious to do by cutting and pasting. Isn't there an easier way?
Michael Goenawan
Kanata, Ontario, Canada

A There is a way to change footnotes to endnotes, but you won't find the answer in any *WordPerfect* manual. The key is to temporarily reformat your document using multiple columns. Since *WordPerfect* can't use footnotes in a multicolumn format, it automatically moves them to the end of the document. Here's how:

1. First, open the document containing the footnotes you want to change. Press **<Home><Home><Up>** to move the cursor to the top of the file.
2. To specify a two-column layout, press **<Alt>-<F7>CD<Enter>O**.
3. Press **<Home><Home><Down><Home><Home><Up>**. This ensures that the entire document reformats into two columns. The footnotes will move to the end of the document, with all other formatting and numbering intact.
4. Now you'll want to return the document to a single-column format. With the cursor still at the top of the file, press **<Backspace>Y** twice to remove the 2-column layout codes.

Remember, if you add more footnotes later, you'll have to repeat this process to convert them into endnotes.

Converting to WordPerfect

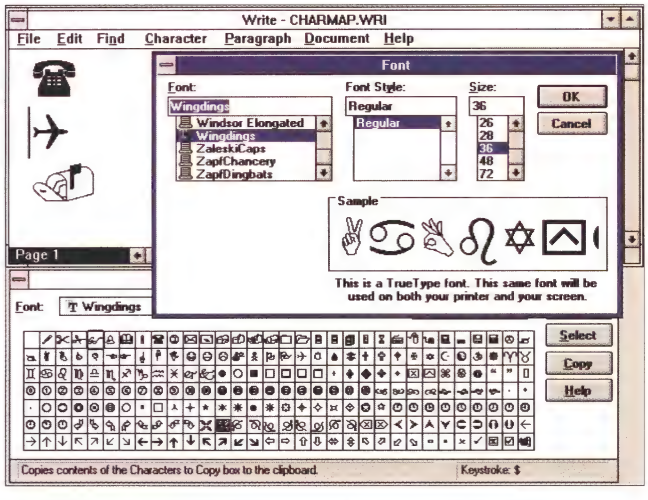
Q I'm trying to edit a genealogy book written in *Professional Write*, but I use *WordPerfect 5.1* for DOS and don't have a copy of the other word processing program. Is there a secret formula for converting from one format to the other, or am I stranded?
Anne C. Johnson, San Antonio

A There's no secret, but you can't make the switch without some help. You need a file conversion utility. One of the best available is MasterSoft's *Word for Word Professional 5.1*. It can convert *Professional Write* files to *WordPerfect* files, as well as translate to and from scores of other formats. For more information on this $149 program, contact MasterSoft at 602/277-0900, 602/970-0706 (fax).

Mapping Windows Characters

Q I use *Windows* Write and have tried to paste special characters from *Windows 3.1*'s Wingdings symbol font into documents using the *Windows* Character Map application. But instead of the symbol I want, I just get a normal keyboard character. What's the story?
Sally Masso
El Paso, Texas

A When it comes to inserting special characters from the Character Map, some *Windows* word processors—such as *WordPerfect for Windows*, *Ami Professional 2.0*, and *Windows* Write—are not very bright. The trouble is, these programs don't paste the font information along with the character. To work around this problem in Write, select *Character•Fonts* and choose a font that matches the one you've chosen in the Character Map window. The next time you paste in a special character, it will appear correctly. Of course, you'll have to change back to your original Write font before you start typing again. Choosing matching fonts before pasting in special characters will solve the problem in other, similarly afflicted *Windows* word processors.



WINDOWS' CHARACTER MAP lets you insert special characters into any Windows word processor, but some, like Windows Write (pictured here), make you specify a new font first.

Dumping Fonts in WordPerfect for Windows

Q The Font button on the *WordPerfect for Windows* ruler displays a customized set of fonts for quick access. It's easy to add fonts to the list, but I haven't found a way to remove a font. Can this be done?
Madelyn Kilgore, Fort Worth, Texas

A Sure. Start by double-clicking the ruler's *Font* button to call up the Font dialog box. Select *Assign to Ruler*, then choose the font you want to remove in the Fonts on Ruler list. To remove each font from the list, select *Clear*. (However, you won't be able to remove Courier, which is the default font.) When you're finished removing fonts, select *OK* twice to return to the editing screen.

Form Fitting in WinWord

Q I'm having trouble with *Word for Windows 2.0*'s table function. I've created a table that I use for filling out a preprinted form. When I type too much data into a particular cell, the row containing that cell increases in height, destroying the alignment when I print the table. How do I fix this?
Paul Parsekian, New York

A By default, *Word for Windows* automatically adjusts row heights in its tables to compensate for text you enter.

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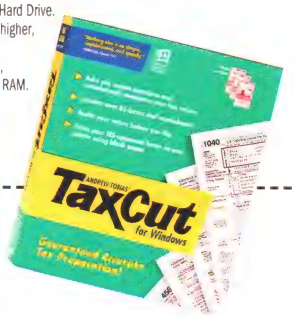

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First, load the document containing your table. Position the cursor in the first cell of a row that needs to have a fixed height, or select multiple rows that will have the same height, then select *Table•Row Height*. In the dialog box's Height of Row list, choose *Exactly*. Then, in the At: frame, type the exact height that row should have (you can enter dimensions in lines, inches, centimeters, or points). Select *OK* to complete the change. Repeat this process throughout the table to set up the precise measurements you need.

Cell height will now remain constant, regardless of how much text you enter. If you do type in more text than will fit, you'll have to crank down the font size to see it all.

Truer Type in Word 5.0

Q I use *Microsoft Word 5.0* and an Epson LQ-2550 dot-matrix printer to keep a small scientific journal. Everything works fine, but the Greek delta character I need for printing equations isn't available, so I must draw it in by hand. Any suggestions?

Henry E. Sostmann
Durham, North Carolina

A Among the math characters missing from the extended ASCII character set, the delta is the one most often needed. Fortunately, there's a fairly cheap solution: MicroLogic Software's *TrueType for DOS*. The $99.95 package adds 18 scalable TrueType fonts to the DOS versions of *Word* and *WordPerfect*. It loads as a memory-resident program, then starts the word processor, complete with a printer driver containing the scalable TrueType fonts. You'll find the delta character, along with other math symbols, inside its Math-PS font. Output quality on 24-pin printers like yours is excellent, and you can even print handy charts to help you find these non-keyboard characters. Contact MicroLogic Software at 800/888-9078, 510/652-5040 (fax).

Creating a Printer File

Q I use *Ami Pro 2.0* with *Windows 3.1* and want to print my documents at another location on a friend's laser printer. Unfortunately, he doesn't have *Ami Pro*. Is there a way I can send him a file that enables him to print my documents exactly as I want them?

Alvin Woo, San Francisco

A You bet. Instead of sending the formatted document, you send a "print file," matched to your friend's laser printer. But first you'll need to do some setup work.

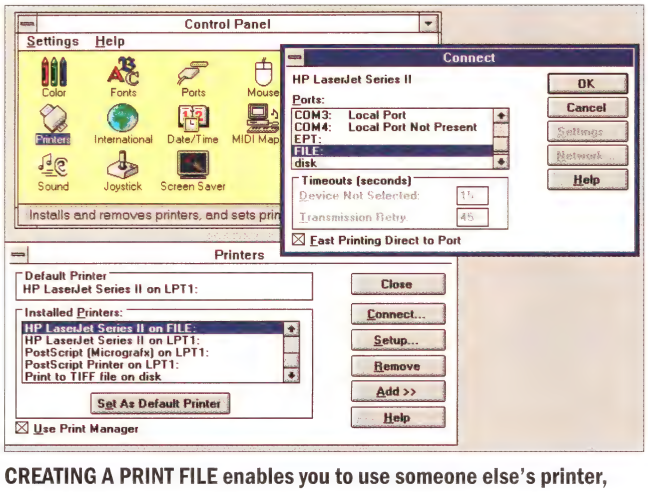
With the *Windows* Program Manager on screen, fire up Control Panel and double-click the Printers icon. In the dialog box, select *Add*, choose a printer from the list that matches your friend's printer, then select *Install*. (You may be prompted to insert the *Windows* installation disk containing the correct printer driver.) Next, select *Connect* and choose *FILE:* in the Ports list. Select *OK*, *Close*, and exit Control Panel.

To make use of this new printer driver from within *Ami Pro*, load the document you want to send, select *File•Printer Setup*, choose the printer you just added, and click *OK*. Select *File•Print•OK*, then type in a drive, path, and file name when prompted. *Ami Pro* will print the document, including all fonts, graphics, and other elements formatted for your friend's printer, into the file you name. Once your friend has the resulting file, he or she can print it out at the DOS prompt by typing **COPY /B** *d:/path/filename.ext* **PRN<Enter>** (substituting the file's drive letter, directory, name, and extension for *d*, *path*, *filename*, and *ext*). The **/B** switch tells the COPY command you're copying a binary file and makes sure the entire file goes to the printer. This technique works not only with *Ami Pro*, but with any *Windows* application.

By George Campbell

George Campbell is a contributing editor for PC World.

Mail your word processing questions to Word Processing, PC World, *501 Second St. #600, San Francisco, CA 94107; or send them electronically to PC World Online, Word Processing; CompuServe, 71571,222; MCI Mail, GCAMPBELL; or 415/442-1891 (fax).* PC World *pays $50 for published questions. Sorry, we can't acknowledge unpublished materials.*



CREATING A PRINT FILE enables you to use someone else's printer, even if he or she doesn't have your application. Just install that printer's driver, make FILE: its port, and select that printer in your app.

USER GROUP TIP

Shrink Reveal Codes Window

After pressing <Alt>-<F3> to reveal *WordPerfect's* hidden-codes window, do you find the window takes up half your screen, leaving little room for editing? Fortunately, you can shrink the window using *WordPerfect's* Setup menu. Press <Shift>-<F1>DER, then specify the number of lines you want under Reveal Codes Window Size (specifying five lines, for example, will take up the bottom fourth of a normal VGA display). Press <F7> twice to record your new default and return to editing.

Tim Mathis
Pasadena IBM Users Group

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WINDOWS Q & A

The Right Write

Q The default font for *Windows* Write is Arial 10. I'd like to use a larger size (like Arial 12), but I can't figure out how to change the default setting. Any suggestions?

Rob Weissman, Annandale, Virginia

A There's no direct way to change Write's default formats (font, font size, margins, and so on), but the following work-around should do the trick quite nicely. First, start a new document in Write, type a single space, then select it. Go to the *Character•Fonts* dialog box and change your font as desired (the sample box will show you a preview of your font choice) and click *OK*. While you're at it, you can also use the *Document* menu to adjust the margins, headers, footers, and tab settings. When you've got things set up precisely the way you want them, save the file in your WINDOWS directory as **DEFAULT.WRI** and exit Write.

Now go to File Manager to make your new file Read Only. Click once on the DEFAULT.WRI file to select it, and press **<Alt>-<Enter>** or *File•Properties*. Turn on the Read Only attribute by either clicking the box next to it or by typing **R**, then click *OK*.

Next, select the Write icon in Program Manager and press **<Alt>-<Enter>** to open the 'Program Item Properties' dialog box. In the 'Command Line' text box, replace the program's executable file name with **DEFAULT.WRI**, then click *OK*. The next time you double-click the Write icon, it will open your default file with all the settings you created.

Personalizing Printers

Q I currently use *Windows 3.1* for desktop publishing and making signs. I have installed and configured three PostScript printers, two Hewlett-Packard printers, and three plotters. This makes for a lengthy and confusing printer list in the Printers section of Control Panel as well as in the Print Setup boxes of my various *Windows* applications. Is there any way to assign names to these devices (such as: "Printer on Bob's Desk," "Big Plotter," and so on)?

J. Eric Hendrickson
Lansing, Michigan

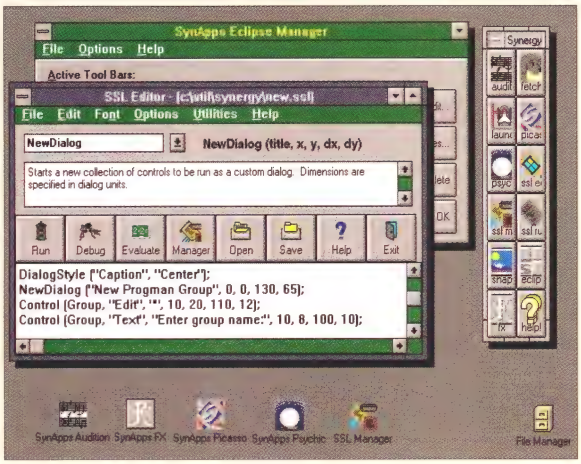
A You can list most printers and plotters by name by making a few changes in the WIN.INI file. First, make a backup of the WIN.INI files (found in the same directory as *Windows*). Then, open the file in Notepad by choosing *File•Run* in Program Manager and typing **WIN.INI**.

Find the [PrinterPorts] heading; underneath it you'll see a list of your printers. To customize a name, edit the entry (a printer name) to the left of the equal sign. For example, you might change the line 'HP LaserJet Series II=HPPCL,LPT1:,15,45' to read **Mary's Old LaserJet=HPPCL,LPT1:,15,45**. Next, search for the [devices] section and repeat these changes, making sure your new printer names match those you typed in the [PrinterPorts] section. Save the file, then exit, and restart *Windows*. The next time you access the Printers section of Control Panel (or any Print Setup dialog box in most *Windows* applications), you'll see your customized printer names. If you changed the name of your default printer, select the new printer name and click *Set As Default Printer*.

Here's another tip: Because Control Panel puts the printers in alphanumeric order, you can rearrange the order of the printers in the list by placing a number before each printer name as part of its custom designation (say, "1Big Plotter"). After you've restarted *Windows*, open the Printers section of Control Panel to sort the list.

Now the bad news: Although this technique works well with the Hewlett-Packard LaserJet family of printers, not all drivers are so trouble-free. Changing the names of PostScript printers can cause minor problems, for example, when you switch between portrait and landscape orientations. And you may find yourself unable to use the 'Generic/Text Only' printer driver at all. Experiment with your printers, and if you encounter difficulties, change the names of problem drivers back to the way you found them.

Windows Toolbox



For a slick set of powerful *Windows* utilities, check out *Synergy 1.0*. The centerpiece of the package is the SynApps Script Language, which enables both novice programmers and power users to create sophisticated scripts and macros. You can execute these and other programs from customizable floating button bars, which can be unique to (and appear with) individual applications. An especially nifty tool is Psychic, which attaches a list of your most recently accessed files to every File Open dialog box for easy retrieval. The collection also includes utilities for sound management and visual effects, a scheduler, an icon editor, a file finder, and a screen-capture utility. Available for $79.95 from SynApps Software, 2208 N.W. Market #500, Seattle, WA 98107; 206/562-3015, 206/784-7125 (fax).

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Sound Management

Q Using *Windows 3.1*'s great sound capabilities, I have been accumulating a lot of WAV files. But the eight-character limit on DOS file names is making it hard to keep all the sounds straight. Doesn't *Windows* include some utility for managing these files? Sound Recorder is of no help.
Alan Reade, Seattle

A *Windows* does not include such a utility per se, but by manipulating the WIN.INI file, you can use *Windows'* Control Panel for this purpose.

Here's how. As always, make a back-up copy of WIN.INI. In Program Manager or File Manager choose *File•Run*, type **WIN.INI**, and click *OK* to open this file in Notepad. Within the [sounds] section, add a line for each sound file you'd like to identify: Type a short description, followed by an equal sign, and then the drive path and file name of your WAV file. For example, you could add a line that reads 'Anemic, tinkly chimes=C:\SOUND\CHIMES-.WAV'. When you've added descriptions for as many WAV files as you want, save the file and restart *Windows*.

Now launch Control Panel and double-click the Sound icon. You'll see your new descriptions in the list on the left and their corresponding WAV files on the right. (It's helpful to limit your descriptions to 20 or 25 characters so they fit in the list box.)

You'll still have to use File Manager to add, delete, or rename these files and update corresponding changes in WIN.INI. For a more robust sound manager, see "Windows Toolbox" on the previous page.

A New Shell

Q I recently switched to *Windows* after working on a Macintosh. I miss the way the Finder lists files and programs. Is there any way to make Program Manager list its icons alphabetically?
Lynn Scott, Salt Lake City, Utah

A What you want is File Manager rather than Program Manager. To make File Manager your shell—the default program that starts and closes with *Windows*—you need to edit SYSTEM.INI, a file in the same directory as *Windows*. First, make a back-up copy of SYSTEM.INI. Then from Program Manager or File Manager, choose *File•Run*, type **SYSTEM.INI**, and click *OK*. When the file opens in Notepad, search for the line that reads 'shell=progman.exe' and edit it to read **shell=winfile.exe.** Save the file and restart *Windows*.

In File Manager, double-click the drive icon to open as many windows as you need. To create a group window like those in Program Manager, select a window and choose *View•Directory Only*. Then in another window choose *View•By File Type* and uncheck every option except *Programs*. To create a group that shows only documents, repeat these steps for yet another window, checking *Documents* instead of Programs (and checking *Directories* too, if you want to see folder icons to navigate to other directories).

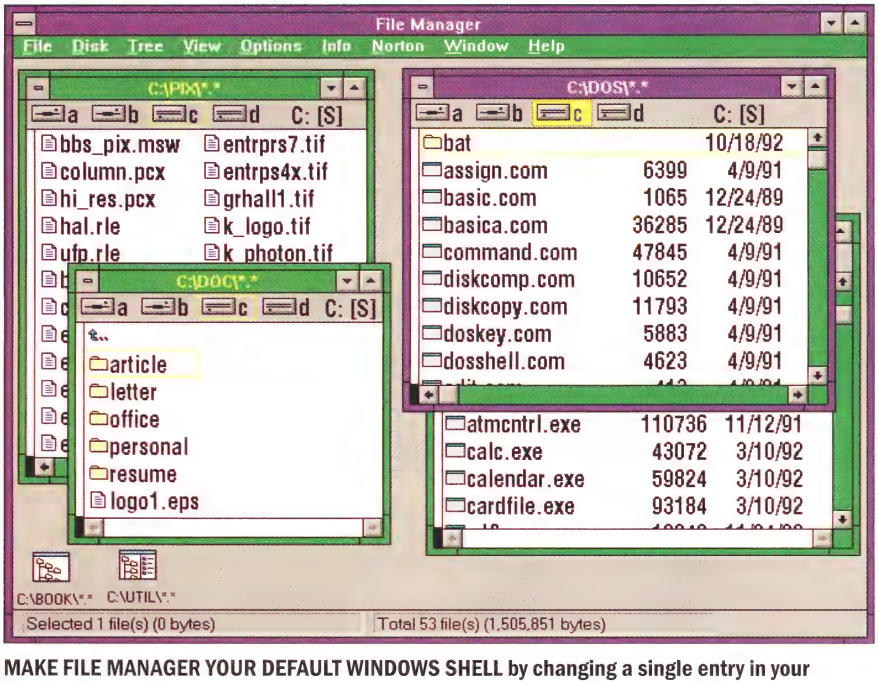
For further customizing of other windows, choose *View•Partial Details* and check only the options that correspond to information you want to see. To see file names only, choose *View•Name*. If you get lost, you can use *View•Tree Only* to create a separate window that shows only a directory tree. To curb clutter, minimize the windows you don't currently need.

To save your customized windows, hold down **<Shift>** as you choose *File•Exit*. To have File Manager always look the same as the last time you used it, choose *Options* and then choose *Save Settings on Exit* if it doesn't have a check mark in front of it.

Each window will retain the view characteristics you gave it, even if you switch to another directory by double-clicking a folder icon or the '..' symbol or you create a new window by double-clicking a drive icon.

This new shell may not be as pretty as Program Manager, but it will simplify things by combining program and file management.

By Scott Dunn



MAKE FILE MANAGER YOUR DEFAULT WINDOWS SHELL by changing a single entry in your SYSTEM.INI file. It's a handy way to combine program and file management.

Scott Dunn is coauthor of 101 Windows Tips *(Peachpit Press, Berkeley, California, 1992) and a contributing editor for* PC World.

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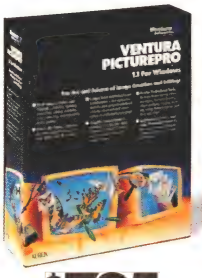

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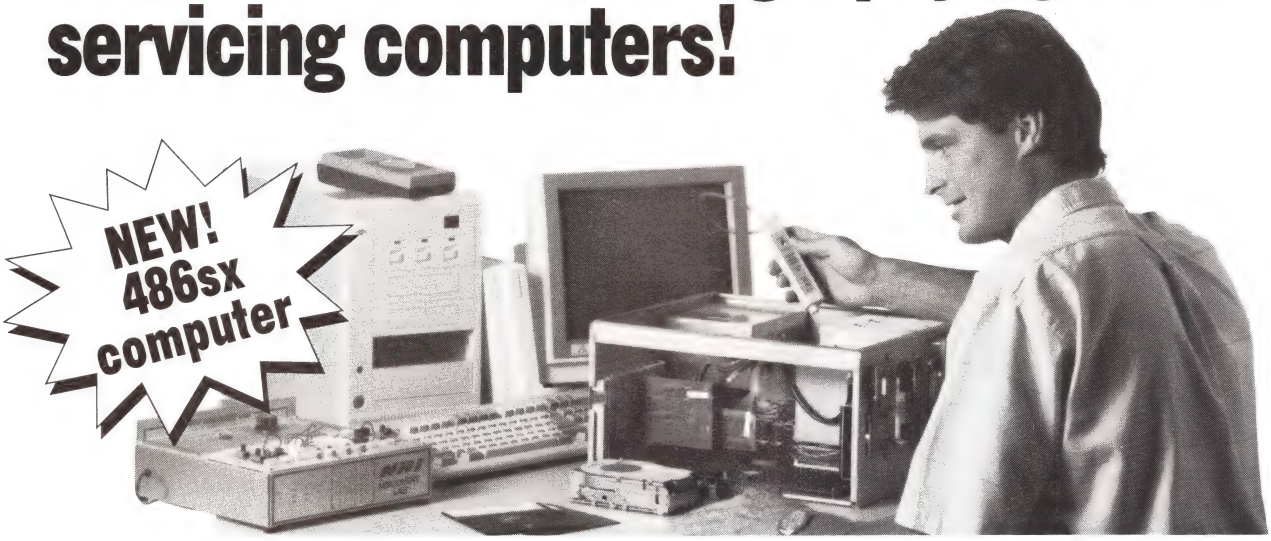

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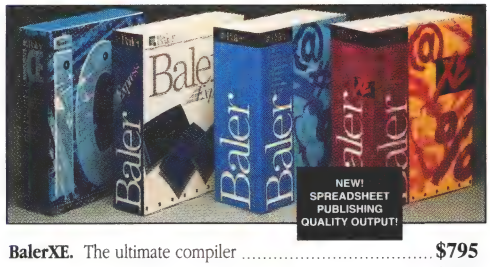

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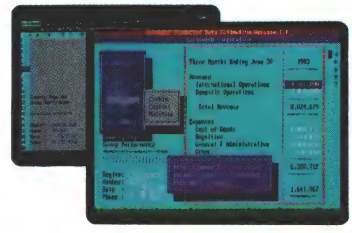

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DATA MANAGEMENT Q & A

Super Delete: Getting Rid of Linked Records in Paradox

Q I do much of my work in a form with two linked tables, LEADS and ACTIONS, with LEADS serving as the master table and both tables keyed on the LeadID field. *Paradox* won't delete a record in LEADS unless the linked records in ACTIONS are deleted first. Is there some way I can delete them all together?
James Suzannah, Detroit

```
IF (SYSMODE() = "Edit" OR SYSMODE()
    = "CoEdit") AND NOT ISFIELDVIEW()
 THEN SHOWMENU
  "Cancel" : "Don't delete",
  "Delete" : "Delete this record"
  TO choice
  IF choice = "Delete"
   THEN
    IF ISFORMVIEW() AND
     LINKTYPE() = "None" AND
     ISMULTIFORM(TABLE(),FORM())
     THEN master = TABLE()
      FORMTABLES
       TABLE()
       FORM()
       tabarray
      IF retval
       THEN
        FOR ctr
         FROM 1 TO ARRAYSIZE(tabarray)
          EXECUTE "MOVETO \""
              + tabarray[ctr] + "\""
         IF LINKTYPE() <> "None"
          THEN delnum=NIMAGERECORDS()
           FOR ctr1 FROM 1 TO delnum
            DEL
           ENDFOR
         ENDIF
         MOVETO master
        ENDFOR
      ENDIF
    ENDIF
    DEL
  ENDIF
 ELSE DEL
ENDIF
```

LISTING 1: DELTRAP.SC DELETES master and detail records linked in a Paradox form.

A Yes, there is. You can write a script that deletes the proper records from both tables, then use the SETKEY command to play the script whenever you press <Delete>. First, enter the text shown in Listing 1 in an ASCII text file called DELTRAP.SC. You can do this from inside *Paradox* with the *Scripts•Editor•New* command (or *Scripts•Editor•Write* if you're using *Paradox 3.5* or an earlier version) or with the text editor of your choice.

To make *Paradox* play this script whenever <Delete> is pressed, press **<Alt>-<F10>**, choose *MiniScript*, and enter **SETKEY "Del" PLAY "DelTrap"**. To make this change permanent, add that line to your INIT.SC file.

Once you have done this, pressing <Delete> will cause *Paradox* to ask for confirmation and then to delete the master record and any related detail records that are in a linked embedded form. Note that the script will ignore records in unlinked embedded forms. If you subscribe to PC World Online, you will find DELTRAP.SC in the Featured in March library.

Printing Conditional Values in Paradox 4.0

Q I've been using *Paradox* to print invoices for my wholesale business. While most of my customers are resellers who don't have to pay sales tax, a few of them do pay sales tax. To handle these exceptions, I've added a field for sales tax to my orders table and have been calculating the tax by hand.

I recently upgraded to *Paradox 4* and am wondering if there are any new features I can use to handle sales tax differently. What I would like is to have a field in my customer table indicate whether a customer is taxable, and then have *Paradox* automatically calculate taxes and include them in an invoice.
Don Korth, Everett, Washington

A *Paradox 4.0* has a new IIF() function with the syntax IIF(*Condition, ValueIfTrue, ValueIfFalse*) that you can use in a calculated field. Let's assume you have a field called Taxable in your CUSTOMER table that is left blank unless a customer pays sales tax, and that all the information for an invoice is stored in a single record of a table called ORDERS, which is linked to your CUSTOMER table via the Customer# field. To design the report, first use *Field•Lookup•Link* to link CUSTOMER to the report (if they are not linked already). Then choose *Field•Place•Calculated*, and use **IIF(ISBLANK([Customer->Taxable]),0.00,[Total]*** *TaxRate*), where *TaxRate* is your state's sales tax rate.

That formula won't work, of course, if your ORDERS table doesn't have a Total field. If your total is coming, via another calculated field, from a linked DETAIL table, you will want to alter the formula to read something like **IIF(ISBLANK([Customer>Taxable]),0.00,Sum([Detail->Qty]*[Detail->Price],group)*** *TaxRate*).

Simple Relations in dBASE

Q My community volunteer organization uses *dBASE III+* to manage our member list. We use two data files, PEOPLE and SERVICES, the latter listing what type of work each member can provide. We handle everything via the Assist menu. When I update the records for an existing member, I usually find the main record in PEOPLE first, make my changes, and note the member number. Then I change the database in use to SERVICES and use Position•Locate to find that member's SERVICES records. Is there an easier way to switch between the files?
Fred Boyd, Los Angeles

A What you've got is a fairly simple one-to-many relationship, something that the Assist menu doesn't support. If none of your members can volunteer skills as a *dBASE* programmer, you can handle the relationship through the dot prompt. At first this may seem more intimidating than using the menu system, but in the end it's easier.

Let's assume you have a field common to both PEOPLE and SERVICES

The Evolution of CAD

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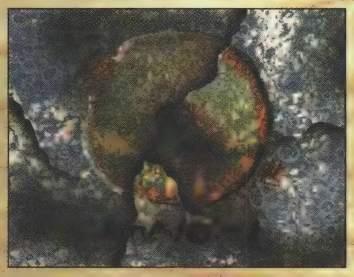
In the beginning of time people had to use primitive design tools for creating any type of graphics.



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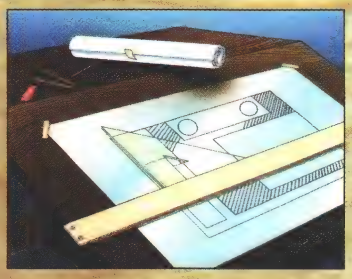
By the 18th Century we had advanced to the drafting table with T-squares, and the dreaded eraser.



In the 20th Century the first CAD programs were very slow and extremely difficult to use, not to mention the expense of buying them.

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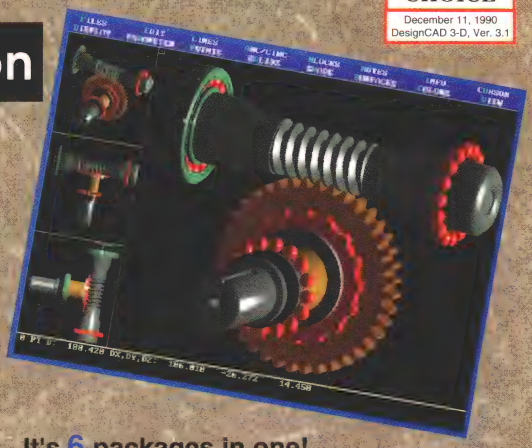

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called MemberNo. From Assist, use *Organize • Index* to set up indexes for both PEOPLE and SERVICES, using **MemberNo** as the index key expression. Call the indexes **PeopMem** and **ServMem**, respectively. Then, before you start editing, press **<Esc>** to go to the dot prompt and type:

```
SELECT 2
USE services
SET INDEX TO servmem
SELECT 1
USE people
SET INDEX TO peopmem
SET RELATION TO memberno INTO services
```

If these commands seem a bit much to enter every time you edit your data, you can copy them into an ASCII text file called **EDITVOL.PRG**. Then you'll be able to run the whole series with the single dot command **DO EDITVOL**. After you've run these commands—however you do it—every time you move to a different PEOPLE record, *dBASE* will find the first matching record in SERVICES.

Now you can start editing PEOPLE. To quickly find the member record you want to edit, enter **FIND** *memno*, where *memno* is the person's membership number. Then press **<F10>** to display the current record for editing. To change that member's SERVICES information, press **<Ctrl>-<End>** to return to the dot prompt, type **SELECT 2** and press **<Enter>**, then press **<F10>** again. The record that appears will be the first for the last member you edited in PEOPLE (or the last record in SERVICES if there is no match). Remember to type **SELECT 1** when you need to go back to PEOPLE.

Recovering Damaged Q&A Files

Q Strange files that have names like '0B2A0F20' appear inexplicably in *Q&A 4.0*. What's more, while we're accessing data, an orange window occasionally pops up stating that we must recover the database. Are these problems connected, and can you give us a solution?
George Murillo, Irvington, New Jersey

A It sounds like you have a damaged database file. When you work with a problem file, *Q&A* may be unable to delete temporary files it normally creates and erases while going about its business. There's no harm in deleting these files.

To address the source of the problem, you'll need to take *Q&A*'s advice and repair the damaged database. First back up your data, then use *File • Utilities • Recover database* on the suspect file. If *Q&A* can't successfully recover your data, try exporting it to an ASCII file with *File • Utilities • Export data* and importing it back with *File • Utilities • Import data*. If that doesn't work, restore it from a backup.

By Celeste Robinson

PC World contributing editor Celeste Robinson is the author of Paradox 4.0 Handbook, *(Bantam Computer Books, New York, 1992).*

Mail your questions to Data Management, PC World, *501 Second St. #600, San Francisco, CA 94107; or send them electronically to PC World Online, Data Management; CompuServe, 74055,412; MCI Mail, 179-3813; or 415/442-1891 (fax).* PC World *pays $50 for published questions. Sorry, we cannot acknowledge unpublished materials.* ■

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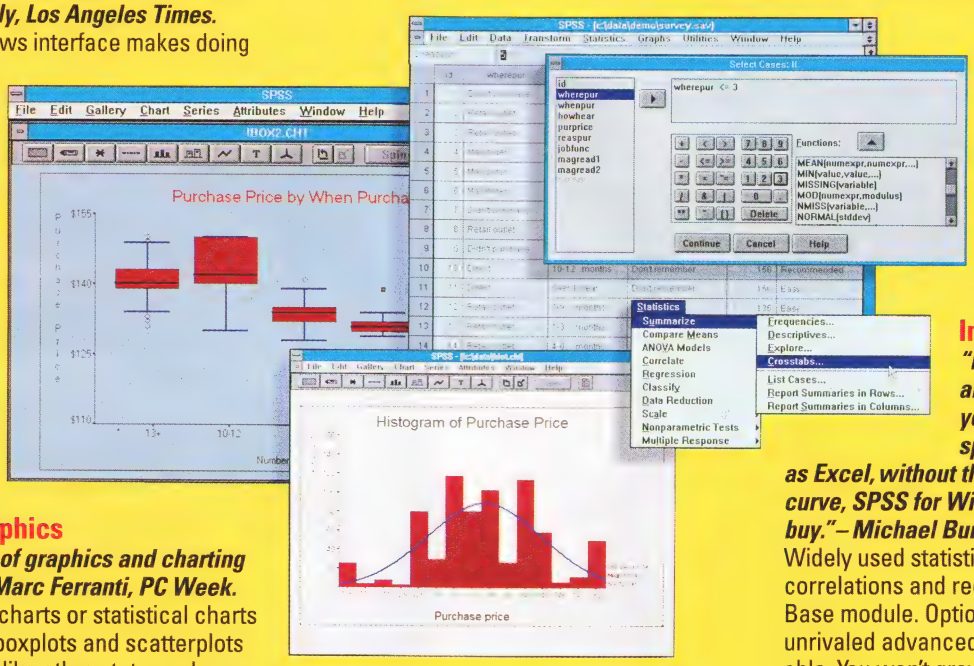

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PUBLISHING & PRESENTATIONS MAKEOVER

Bottom Line Considerations

This month we take our scalpels to *The Bottom Line*, a newsletter published by Integral Systems, a Walnut Creek, California, developer of mainframe software for human resource and financial departments. Published four times a year, *The Bottom Line* keeps more than 2000 Integral clients up-to-date on new products, services, and personnel.

Unlike most newsletters, which are text rich and graphics poor, *The Bottom Line* suffers from visual overload—photos, boxed items, and an oddly placed banner all compete for the reader's attention. Our mission: to reorganize the various graphical elements into an inviting, informative design.

Redesigning Top to Bottom

The first order of business was to get that banner back where it belongs—on top of the page. Typically the first thing that meets the readers' eye, a newsletter's banner is the key to establishing its identity. Ideally, a banner should use an attractive typeface and reinforce the publication's message. We replaced the original's hard-to-read type treatment with a *Corel Draw* graphic, creating a visual metaphor out of the title.

Since "Let's Talk" is the main story in the newsletter and has the most interesting graphic, we placed it next. We enlarged the photo to spread across three columns and cropped it, removing approximately 25 percent of the image to zoom in on more important details. We also rewrote the caption to fill out the space beneath the photo and give more information.

Moving the banner up meant relocating the article about the new CEO. But even though the story is now on the bottom of the page, its unique layout makes it more visually compelling than the original. By wrapping the text along the outline of the photograph and rewording the headline slightly, we created a friendlier, more personable introduction to Integral's new boss.

While we retained the newsletter's four-column layout, we stripped out the distracting vertical rules, moved the columns slightly closer together, and expanded the right and left margins. We also got rid of the large initial capitals and the line spaces between paragraphs, using standard indents instead. The new page contains more text but seems less cluttered; it also provides more "thumb space" for people to hold the page while they read.

As for type, we replaced the original's mix of New Century Schoolbook (body text) and Helvetica (headlines) with a variety of Helvetica fonts—normal weight for body type, boldface for headlines, and italic for subheads and captions. Helvetica provides two big advantages: It's extremely versatile, so you can use one type family for all parts of your document, and it's available with virtually every page layout program, as well as any laser printer.

Finally, the original table of contents is far too large. Since Integral's business is software development, we used *PageMaker*'s drawing tools to turn the TOC into a pulldown menu—further reinforcing the company's identity.

Next month: Contributing Editor Richard Jantz answers questions about *Microsoft Publisher, PageMaker, Corel Draw, Ventura Publisher*, and others.

By Daniel Tynan and David Brickley

Daniel Tynan is a contributing editor for PC World. *The redesign was performed by David Brickley, a designer based in Moss Beach, California.*

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1 **We created the new banner using *Corel Draw*. First we drew two rectangles, adding different fills to create a drop-shadow and gray shading. The title is reversed type (60-point Helvetica Light Condensed), modified slightly to raise the centerlines of each character. We then drew a very thin rectangle and extended it from the baseline of the letter E—creating "the bottom line." Finally, we exported the graphic to *PageMaker* as an EPS file.**

2 **Helvetica's clean sans serif look makes the dateline readable even in 6-point type and full capitals.**

3 **We set the headline in 29-point Helvetica Bold and kerned it manually. The subhead is 11-point Helvetica Italic.**

4 **We scanned a photograph and used *PageMaker*'s cropping tools to reduce its top and right margins. We increased its size by about 40 percent, maintaining its height-to-width ratio. We then created a transparent box with 1-point lines, and laid it over the picture to provide a border.**

5 **Using 9-point Helvetica type with 11-point line spacing fits more text on the page without crowding it.**

6 **We scanned this photo as a 256-shade TIFF file, loaded it into a paint program, and painted the background white. After importing it into the page layout, we drew two rules (one on either side of the image) and flowed the text around the picture using *PageMaker*'s text-wrap tools.**

7 **Two rectangles drawn in *PageMaker* make the pulldown menu; the smaller black one contains reversed 12-point Helvetica Bold for the title. TOC entries are 8-point Helvetica.**

AFTER

1 THE BOTTOM LINE

2 NEWS FOR INTEGRAL CLIENTS — WINTER 1992 VOLUME 3, NO. 2

3 # Let's Talk

Clients help Integral to create new software in special design

4 This July, the walls in a room at Integral headquarters were covered with butcher paper.

No, it wasn't a new decorating scheme at the Walnut Creek, CA, offices. It was the only way Joel Summers, Vice President of New Technologies, could display information gathered during a three-day joint requirements planning (JRP) session for accounts receivable and credit products.

5 For the past year, Integral has paid the expenses of clients and industry experts to come to Walnut Creek to share their ideas of what software of the future will look like and how it will perform. Integral will use this information to design its next generation of financial software.

"The best approach to producing a system is to have the people who actually use it assist in its design. That guarantees its usefulness when it's developed," says Summers, to explain why Integral is using this customer-oriented approach.

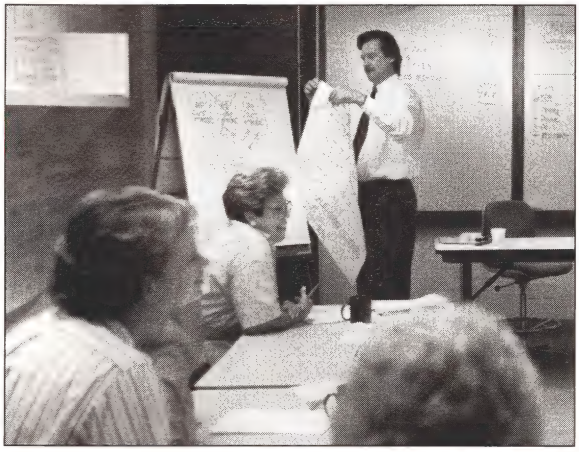
"No matter how good a developer is, he or she can't anticipate all the needs of an end-user. Only an end-user can do that, and with a wealth of clients, across a number of industries and countries, we have a tremendous resource at our fingertips," he adds.

Ann Roque, Credit Manager for the Rain Bird Companies, the world's leading manufacturer of irrigation products, was one of the many Integral clients who participated in this first level of design.

During these three-day to week-long sessions, the participants brainstorm about concepts behind systems-how a financial package should work, for instance.

Roque's 20-year experience as an end-user of various ac-

(continued on page 2)



At Integral's joint application design sessions, clients, consultants, and Integral's staff discuss what software of the future will look like and how it will perform.

6

Meet George Klaus, our new CEO

Integral is proud to announce its new company chairman, president and CEO, George Klaus. He brings outstanding credentials to Integral for running a successful organization.

George has more than 25 years of executive management experience in engineering, marketing and sales at some of the software industry's leading corporations. Prior to Integral, George was president of Valid Logic Systems, where he spearheaded record growth levels and was instrumental in the company's resurgence as a leader in the electronic design software market.

(continued on page 4)

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BEFORE

George Klaus

Meet our new CE

Integral is proud to announce its new company chairman, president and CEO, George Klaus.

He brings outstanding credentials to Integral for running a successful organization.

George ha years of e agement ineering, sales at s ware indu corporati tegral, Ge dent of Va Systems,

THEBOTTOMLINE

News for Integral Clients — Winter 1992 Vol. 3, No. 2

Let's talk

Clients help Integral create new software in special design sessions

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Idea exchange

For the past year, Integral has paid the expenses of clients and industry experts to come to Walnut Creek to share their ideas of what software of the future will look like and how it will perform. Integral will use this information to design its next generation of financial software.

Continued on page 2

Ann Roque, top left, shares her ideas during Integral's joint application design session for accounts receivable and credit.

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4 Integral News
5 Documentation Focus
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8 Training Schedule

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INTEGRAL

COMMUNICATIONS Q & A

Remote Windows Access

Q I'd like to remotely use a computer running *Windows*. Is there any software that will allow me to do this?
Steven Seyster, Elmont, New York

A Most remote communications packages claim to support remote *Windows* access, but all have limitations. Running a computer remotely is inherently slow (a 9600-bps modem is mandatory on both ends). Some packages won't run *Windows* in enhanced mode, many do not support a remote mouse, and their graphic requirements can be fussy. (You may get a blank screen dialing into a VGA PC with an EGA-equipped one, for instance.)

Still longing to run your work PC from home? Try Norton-Lambert's *Close-Up*, 805/964-6767, 805/683-5679 (fax). *Windows*-wise it's the best of the pack, with both enhanced mode and mouse support. For more information, see our roundup review "Remote Communications Software: The Next Best Thing," in February 1992.

Easy On-Line Session Tracking

Q I'm looking for a program, preferably shareware, to keep track of the amount of time I spend on line.
Sheila McFarland
Hackensack, New Jersey

A Most communications programs include a feature that keeps a record of your calls and the time you spend on line, although you usually have to do some hunting through the documentation to find it. In *Procomm Plus*, the session log is in a file called PCPLUS-.FON, which you can examine with the view command **<Alt>-V**. In *Qmodem*, session logging is activated with **<Alt>-O**. If your communications program lacks this feature, download COMLOG-10.ZIP from the Featured in March section of PC World Online. This free TSR (terminate and stay resident) program will log your time when you load it with your communications software.

Sorting Shareware From Freeware

Q What is the difference between shareware, freeware, public domain software, and pirate software?
Amol Parolekar, Troy, Michigan

A Shareware is software that has been uploaded to BBS's and on-line services with a price tag attached. You can use it, but you're morally obligated to pay the author a small fee. Look for shareware that is registered with the Association of Shareware Professionals. That means the author has agreed to support the product and not vanish into the bitstream with your money.

Freeware originally meant the same thing as shareware. The term was trademarked by one of shareware's pioneers, Andrew Fluegelman, and fell out of popularity. It has lately re-emerged to mean software that is free to use, though its author retains the copyright.

Public domain software is also free. The author may be lax about retaining its copyright or may even encourage others to rewrite (and distribute) it.

Pirate software is commercial stuff that has been uploaded illegally to BBS's and on-line services.

What Happened to Videotex?

Q About a year ago I saw an ad for the National Videotex on-line service. I called and gave them my credit card number, but I never heard from them. Soon after, their 800 number was disconnected. Now they're advertising again in *PC World*. What's going on?
David Harrenstein, Center Point, Iowa

A National Videotex—a graphical, general interest service in the same vein as Prodigy or America Online—is back. According to Pamela Maxwell, communications manager at U.S. Videotel, the company has undergone a transformation since the original ads ran. "The old National Videotex Network was understaffed and undercapitalized. Seeing that as a problem, our parent company bought more shares. We are now well capitalized and well staffed, and have had subscribers since May." Call them at 800/336-9096.

By Judy Heim

Judy Heim is a contributing editor for PC World.

Mail your communications questions to Communications Q&A, PC World, *501 Second St. #600, San Francisco, CA 94107; or send them electronically to PC World Online, Communications Q&A; CompuServe, 75300,713; MCI Mail, 312-7737; GEnie, JUDY.HEIM; Internet, 3127737@mcimail.com; or 415/442-1891 (fax). PC World pays $50 for published questions. Sorry, we cannot acknowledge unpublished materials.*

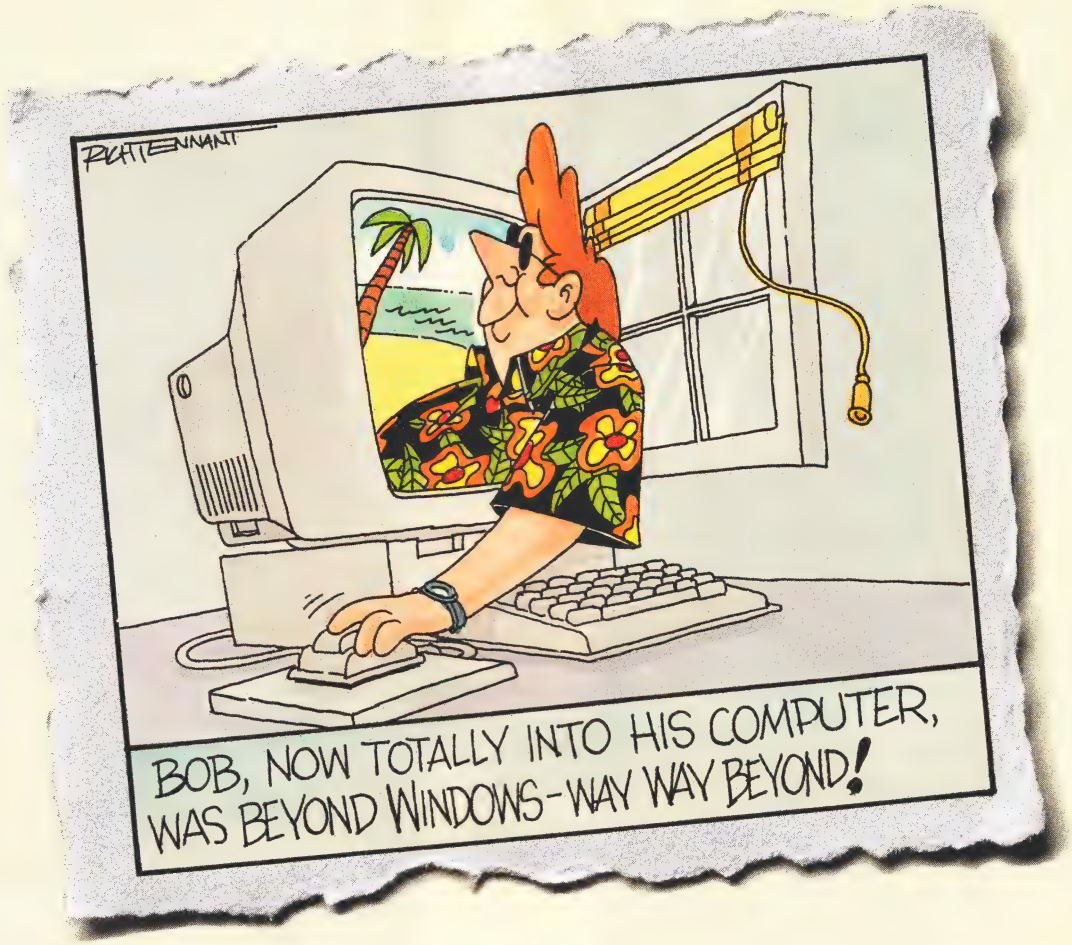
USER GROUP TIP

Faster Procomm Dialing

I'm always calling private BBS's to upload and download files and on-line services such as CompuServe to get E-mail. Because I charge many calls to my credit card, I have to punch in my long-distance access number, the number I want to call, and my credit card number—almost 40 digits.

To save time when dialing, I use a simple AT command to tell my modem to decrease the time it waits between sending each digit to the phone line. From *Procomm 2.0*'s terminal mode, type AT S11=55 and press <Enter>. (Because some phone carriers won't accept that fast a setting, you'll need to experiment to find the one that works best. The default is typically S11=70.) Once you determine the speed your carrier will accept, add the S11 parameter to *Procomm*'s initialization string. Type <Alt>-S from *Procomm*'s terminal mode, then MMA to get to the initialization string setup area. (If you're using *Procomm 1.1*, you'll need to type MGA.) Just place your new S11 parameter before the '^M' that ends the string, then press <Enter><Esc><Esc><Esc>Y to make the changes permanent.

Steve Bass
Pasadena IBM Users Group



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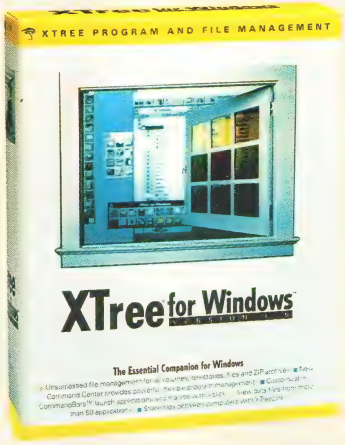

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STAR-DOT-STAR TIPS

Disconnecting Your Extension

Combining the technique illustrated in Mr. David Graczyk's "Fantastic FOR" [*Star-Dot-Star*, September 1992] with a looping batch file, I've created PARSE-.BAT [Listing 1], which separates a file name from its extension. I originally created this batch file so I could open *AutoCAD* files from Tandy's *Deskmate* desktop. *Deskmate* normally passes complete file names to applications, but *AutoCAD* refuses to open a drawing unless it is given a file name with no extension. I just type Parse *filename.ext* at the DOS prompt, and the batch file strips the extension from the file name so *AutoCAD* will load it. You can also use this utility to create backup copies of files for programs that don't create backups automatically.

Peter G. Bartlett, Davenport, Iowa

Editor's note: Mr. Bartlett's batch file makes up for a serious omission in DOS's batch language: its inability to parse file names. But loading *AutoCAD* files is just one of dozens of useful functions PARSE.BAT can take care of for you.

Following Bartlett's suggestion, I've written a small batch file called BAK-.BAT (Listing 2) that uses PARSE.BAT to strip a file name from its extension, create a copy of the original file with a BAK extension, and then launch DOS's EDIT utility. I've also modified PARSE.BAT to clean up after itself by deleting all environment variables except FNAME and EXT, and to leave an exact copy of the extension in the EXT variable for later use. This lets you perform operations such as testing a file's extension to see if it matches a predetermined pattern.

This batch file is worth studying; it illustrates important batch programming techniques. The batch file sets the variable BNAME equal to %0's value (the batch file's name), allowing the batch file to call itself reliably. (If a batch file doesn't use SHIFT, it can use %0 whenever it needs to refer to itself and needn't set a variable.) It also uses a variable (TARGET) to hold the name of another variable—a useful trick that allows it to perform an indirect assignment. Finally, it uses the FOR statement with the / character in two ways: In the first FOR, it removes the first character from an environment variable and leaves the rest; in the second, it uses the first character and discards the rest.

If you have trouble following the flow of execution within this batch file, bear in mind that invoking one batch file from another terminates the first batch file unless the CALL statement is used. Thus the second FOR statement executes only one time; when it invokes a batch file without a CALL, the FOR loop is terminated.

```
@ECHO OFF
IF NOT "%9"==""  GOTO SKIPm
SET STR=%1.
SET BNAME=%0
SET TARGET=FNAME
%BNAME% %STR% * * * * * * * *

:SKIP
IF "%9%"==."  GOTO NEXT
SET FIRST=%STR%

FOR %%F IN (/%STR%) DO SET STR=%%F

SHIFT
ECHO FIRST=%FIRST%
ECHO STR=%STR%
FOR %%F IN (/%FIRST%) DO %BNAME% %1 %2 %3 %4 %5 %6 %7 %8 %%F

:NEXT
SET %TARGET%=%1%2%3%4%5%6%7%8
IF NOT "%1"=="*" GOTO EXIT
SET %TARGET%=%2%3%4%5%6%7%8
IF NOT "%2"=="*" GOTO EXIT
SET %TARGET%=%3%4%5%6%7%8
IF NOT "%3"=="*" GOTO EXIT
SET %TARGET%=%4%5%6%7%8
IF NOT "%4"=="*" GOTO EXIT
SET %TARGET%=%5%6%7%8
IF NOT "%5"=="*" GOTO EXIT
SET %TARGET%=%6%7%8
IF NOT "%6"=="*" GOTO EXIT
SET %TARGET%=%7%8
IF NOT "%7"=="*" GOTO EXIT
SET %TARGET%=%2%3%4%5%6%7%8
IF NOT "%8"=="*" GOTO EXIT
SET %TARGET%=

:EXIT
IF "%TARGET%"=="EXT" GOTO DONE
SET TARGET=EXT
%BNAME% %STR% * * * * * * * *

:DONE
@ECHO File name     %FNAME%
@ECHO Extension     %EXT%

SET STR=
SET FIRST=
SET BNAME=
SET TARGET=
```

LISTING 1: PARSE.BAT PARSES A COMPLETE FILE NAME into a file name and extension by calling itself many times and using a special quirk of the FOR statement that lets you extract the first character from a string.

An Audible Pause

I use DOS's PAUSE command to halt batch files temporarily after they display a screen of data. Since I'm usually busy while the batch files run, I'm not always looking at the screen when the program pauses. That's why I've altered COMMAND-.COM to make the computer beep whenever it runs PAUSE.

Here's how to make the change to DOS 5.0. Copy COMMAND-.COM to a new file (call it NEWCMD-.COM); then use a hexadecimal editor such as *The Norton Utilities'* DISKEDIT (DE) to edit the file. Search the

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file for the *second* occurrence of 'to continue' (in *Norton*'s DISKEDIT, the command to search for a string the first time is **<Ctrl>-S**; to find the second occurrence, type **<Ctrl>-G**). At the end of the message, which reads 'Press any key to continue . . .', there will be a hex 0D (a carriage return) and a hex 0A (a linefeed). Replace both with the character hex 07 (bell). Then exit the editor, telling it to write the changes to disk.

You should then have a new version of the command interpreter that beeps when it prompts you to press a key before continuing. (To make sure you did it right, try executing NEWCMD.COM and typing PAUSE at the prompt. If it works, you'll hear two beeps.) You may then replace your original COMMAND.COM with the new one. This command also causes the DIR /P command to beep when it pauses between directory pages.

Jeremy Lepel, Rochester, New York

Editor's note: This trick ensures you'll know when your computer pauses for input. But since you might not always want it to be this noisy, make sure you save a copy of your original COMMAND.COM (perhaps in C:\DOS\OLDCMD.COM). That way, it will be easy to revert to a silent prompt.

If you don't have a hex editor, use DOS's DEBUG utility to edit NEWCMD.COM. At the DOS prompt, type **DEBUG NEWCMD.COM** and press **<Enter>**. Next type **S0 FFFF 20 2E 20 2E 20 2E** and press **<Enter>** to search for the '. . .' string that ends the 'to continue' message. DEBUG will display two lines of hex addresses. Type **E** followed by the last four characters of the hex addresses and press **<Enter>** to edit the message. Press **7<Space>7<Enter>** to change the first space-and-period pair to bell characters. Then press **W<Enter>** and **Q<Enter>** to save the changes and exit DEBUG.

```
IF "%1" == "" THEN GOTO NOBACKUP
CALL PARSE %1
COPY %1 %FNAME%.BAK
:NOBACKUP
EDIT %1
SET FNAME=
SET EXT=
```

LISTING 2: BAK.BAT CREATES A BACKUP copy of a file and loads it into DOS's EDIT utility.

Preventing Voyeurism Under Windows

If you use *Windows 3.1* and share your computer with others—or suspect that somebody may be snooping around your hard disk when you're out of the office—there's an easy way to keep your personal files safe from prying eyes: Use extended-ASCII characters in your directory and file names. Most *Windows 3.1* programs can't access directories or files whose names employ characters with codes above 127.

To try this, create a small text file: At the DOS prompt, type **COPYCON F**, hold down **<Alt>** and type **255** using the numeric keypad, then press **<Enter>**. DOS will return the prompt to the next line. Enter a line of text such as **This file cannot be read in Windows**. Press **<Ctrl>-Z** and then **<Enter>** to save the file and return to the DOS prompt. When you call up a directory listing, the file will look as if its name is *F*—only you will know about the invisible character at the end.

You can access this file from most DOS applications, but when you try to open the file from *Windows*, you'll get a message saying that the document does not exist or the path is invalid. To lock out several sensitive files in one shot, store them in a directory using extended-ASCII code 255 in the directory name. *Windows'* File Manager will not let you enter the directory, though files inside it will show up when you use its File•Search command. Later, when you want to open the files inside *Windows*, you'll have to rename them using DOS's REN command.

Alan Eldridge, Wilmington, Ohio

Editor's note: While this trick will prevent people from peeking at your files via most *Windows* applications, there are still a few nonconformist programs (mostly obsolete) that don't use *Windows'* common dialog boxes and can therefore access the files. Also bear in mind that *Windows* does recognize a handful of extended-ASCII characters, such as character code 129, which produces a U with an umlaut. There are also a few DOS programs that won't read file names using character codes above 127—in particular, *WordPerfect 5.1*. In such cases you'll need to rename the files using normal ASCII characters.

Right Face

Power Tip No. 256 in *Star-Dot-Star*, August 1992, contains a *1-2-3* macro that right-aligns labels in a cell. That macro can cause problems if the label text doesn't fit inside the field. Listing 3 is a solution that works even if the column width is increased or decreased, as long as the column width is greater than or equal to the width of its contents. (If the contents won't fit in the column, the macro leaves the contents left-justified in the cell.) My version adds two lines, one to test for decreased column width and one that looks for columns that are too small (to prevent replacing the contents with ERR). To run the macro, put the cursor on the cell holding the label you want right-aligned and press **<Alt>-A**.

John Wertheim
Monsey, New York

```
     A       B       C       D       E       F       G       H       I       J

1  \A       {if @cellpointer("type")<>"l"}{beep 2}{quit}
2  L        {if @left(@cellpointer("contents"),1)=" "}{edit}{home}{right}{del}~{branch L}
3           {if @cellpointer("width")<@length(@cellpointer("contents"))}{quit}
4           {edit}{home}{del}
5           @repeat(" ",@cellpointer("width")-@length(@cellpointer("contents")))&"
6           {end}"{calc}~
```

LISTING 3: THIS 1-2-3 MACRO RIGHT-JUSTIFIES A LABEL within a spreadsheet column—and won't cause problems if the label is too big for its field.

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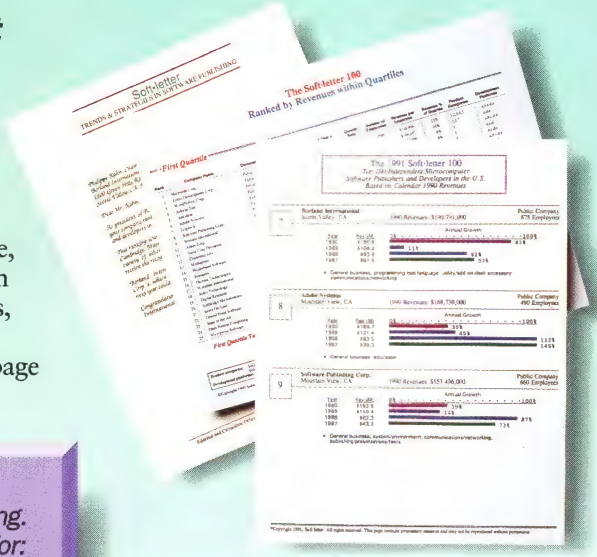

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Editor's note: I improved upon this macro still more, adding a line at the beginning that causes the macro to quit with a beep if the cell does not contain a label. The second line of the macro loops until it has deleted all leading spaces, and the third exits if the contents are too wide for the column. As always, enter this macro in an out-of-the-way place in your worksheet. Every label that begins with a slash (/ or \) must be preceded by an apostrophe; in other words, type in the first cell entry as **'\A**. Once you've entered the macro, use /Range•Name•Labels•Right to assign the names in the left-hand column to the cells to their right. After this is done, pressing <Alt>-A will run the macro. This macro will be available as FLUSHRT.WK1 in PC World Online's Featured in March folder.

Instant Accents

After reading Maria Zambrano's question regarding foreign characters in *Windows* [*Windows Workshop*, July 1992], I wanted to share a *Microsoft Word for Windows* macro I rely on to create accented characters. My macro, which I call InsertAccent [Listing 4], allows you to enter foreign characters easily by typing the letter and pressing a second key that adds the appropriate diacritical mark. For example, to type the character *è* you'd type **e** and follow it with the key that invokes the macro. In my organization we create documents in both English and Spanish. While I use the macro mainly to create Spanish characters, you can easily customize the code to provide shortcuts for other foreign language symbols.

Sherwin Zadeh, Los Angeles

Editor's note: This macro has other great uses—it can convert an *R* into a registered trademark symbol and a plus sign (+) into a plus-or-minus sign (±). Since many foreign languages require grave accents (for example, *à*) as well as acute accents (*á*), I've added a list of the appropriate ASCII codes for characters using grave accents (Figure 1), so you can create a macro to insert those as well. (To figure out codes for other accents such as umlauts and circumflexes, fire up *Windows'* Character Map accessory and move the mouse over the grid until you find

```
Sub MAIN
DisableInput
CharLeft(1, 1)
chPrev$ = Selection$()
Select Case Asc(chPrev$)
  Case 65
    Insert Chr$(193)     ' Á
  Case 69
    Insert Chr$(201)     ' É
  Case 73
    Insert Chr$(205)     ' Í
  Case 79
    Insert Chr$(211)     ' Ó
  Case 85
    Insert Chr$(218)     ' Ú
  Case 78
    Insert Chr$(209)     ' Ñ
  Case 67
    Insert Chr$(199)     ' Ç
  Case 97
    Insert Chr$(225)     ' á
  Case 101
    Insert Chr$(233)     ' é
  Case 105
    Insert Chr$(237)     ' í
  Case 111
    Insert Chr$(243)     ' ó
  Case 117
    Insert Chr$(250)     ' ú
  Case 110
    Insert Chr$(241)     ' ñ
  Case 99
    Insert Chr$(231)     ' ç
  Case 63
    Insert Chr$(191)     ' ¿
  Case 33
    Insert Chr$(161)     ' ¡
  Case 82
    Insert Chr$(174)     ' ®
  Case 43
    Insert Chr$(177)     ' ±
  Case 48
    Insert Chr$(176)     ' °
  Case Else
    CharRight
    Beep
    Print "Not valid"
End Select
  End Sub
```

LISTING 4: THE INSERTACCENT MACRO CONVERTS ORDINARY CHARACTERS in Word for Windows into characters with acute accents or other special marks.

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NORTON DESKTOP FOR WINDOWS 2.0

Norton Desktop for Windows 2.0 can launch programs as well as manage files, directories, and disks. Keys to press are shown here in **boldface**. Keys to press simultaneously are joined by a hyphen. A bullet (•) separates menu, option, and button names in a series.

DESKTOP ICONS

In addition to *NDW*'s title and menu bars and your program group windows, these icons appear on the desktop.

Icon	Drop file on icon to:	Double-click on icon to:
A:	Copy file to floppy drive	Open floppy drive window
C:	Copy file to hard drive	Open hard drive window
F:	Copy file to network drive	Open network drive window
	Back up file	Open Norton Backup
	Print file	Open Print dialog box
	Delete file	Open Norton SmartErase
	View file	Open Norton Viewer

MANAGING THE DESKTOP

Arrange desktop icons	**<Ctrl>-A** or **W**indow • Arrange **D**esktop
Renew desktop	**<F5>** or **V**iew • **R**efresh
Arrange selected group's icons	**W**indow • Arrange Group **I**cons
Cascade group and drive windows	**<Shift>-<F5>** or **W**indow • **C**ascade
Tile group and drive windows	**<Shift>-<F4>** or **W**indow • **T**ile
Change selected group's view style	**W**indow • **V**iew Group As, select view style, OK
Display printer icon	**C**onfigure • **P**references • **P**rinters, select printer, OK • OK
Close all windows	**W**indow • Close **A**ll
Open closed window	**W**indow • *number*
Hide/unhide all windows	**W**indow • **H**ide All/Un**H**ide
Get system info	**T**ools • **S**ystem Info
Open help index	**H**elp • **I**ndex
Shell to DOS	**<Ctrl>-D** or **F**ile • **R**un DOS
Return from shell	**EXIT<Enter>** at DOS prompt
Quit *NDW*	Close DOS apps. **<Alt>-<F4>**, **<Alt><Space>** • **C**lose, or **F**ile • **E**xit

CUSTOMIZING THE DESKTOP

Create icon	**T**ools • **I**con Editor, draw icon, **F**ile • Save **A**s, type name, OK
Replace tool icon	Click icon, **I**con. Select alternate icon file, select new icon; or Use **D**efault. OK
Rename tool/drive icon	Click icon, **L**abel, type label, OK
Select tool icons to display	**C**onfigure • **P**references, select tools, OK

CUSTOMIZING THE DESKTOP (continued)

Select drive icons to display	**C**onfigure • Drive **I**cons, select drives, OK
Configure Control menu	**C**onfigure • **C**ontrol Menu, select menu item(s), OK
Add command to menu	**C**onfigure • **E**dit Menus, select available command, select menu, **A**dd • OK
Select *NDW*'s short (or long) menus	**C**onfigure • Load (Full) **M**enu, select menu, OK
Password-protect Edit menus and Load menu	**C**onfigure • Menu **P**assword, type password, OK, confirm password, OK
Password-protect group window icon	Select icon, **<Alt>-<Enter>** or **F**ile • **P**roperties, **O**ptions • Pass**w**ord, type password, OK, confirm password, OK • OK • OK
Save desktop configuration	**C**onfigure • **S**ave Configuration

MANAGING DRIVES

Drive windows default to a two-pane display. The Tree pane shows a directory tree, and the File pane lists the files and directories of the Tree pane's selected directory. The optional View pane appears beneath the others and shows a selected file's contents. You can use Button Bar buttons at the bottom of drive windows to invoke commands.

Open drive window	Double-click drive icon; or **<Ctrl>-W** or **W**indow • Open Drive **W**indow, type drive letter, **<Enter>**
Select drive window	Click window; or hold down **<Ctrl>**, **<Tab>** until window is highlighted
Show/hide Tree pane	**V**iew • **T**ree Pane
Show/hide File pane	**V**iew • **F**ile Pane
Show/hide View pane	**V**iew • **V**iew Pane
Set default drive window font	Open or select drive window; **V**iew • Fo**n**t; select font, style, and size; **A**pply to All Open Drive Windows • OK
Select file details (size, date, and so on) to show	Open or select drive window, **V**iew • File **D**etails, select details, OK
Show/hide drive window Button Bar(s)	**C**onfigure • **B**utton Bar • **D**isplay Button Bar
Edit Button Bar button(s)	**C**onfigure • **B**utton Bar, select new function from Menu Item list, click button, OK
Move between panes in selected drive window	**<Tab>** or click pane
Format disk	**D**isk • **F**ormat diskette; select drive letter, size, and format type; OK
Copy disk	**D**isk • **C**opy diskette, select source drive, select target drive, OK
Label disk	**D**isk • **L**abel Disk, type label, select drive, OK
Connect network drive	**D**isk • Connect **N**et Drive, select drive letter, **B**rowse, select server and volume, select directory, OK • **M**ap • **C**lose
Disconnect network drive	**D**isk • **D**isconnect Net Drive, select drive, Map **D**elete • **C**lose

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MANAGING GROUPS

Select minimized-group or item icon	Click icon; or hold down **<Ctrl>**, **<Tab>** until name is highlighted
Create new group	**File • New • Group**, type title, OK
Create new item in selected group	**File • New • Item**, type title, type program/document/script name or use **Browse**, OK
Replace minimized-group or item icon	Select icon, **<Alt>-<Enter>** or **File • Properties • Icon**, select alternate icon file and icon or Use **Default**, OK • OK
Delete minimized group or item	Select icon, **<Delete>** or **File • Delete**, **Yes**
Rename minimized group or item	Select icon, **<Alt>-<Enter>** or **File • Properties**, type name, OK
Open minimized group window	Double-click icon; or select icon, **<Alt><Minus>Restore**
Move group window or icon	Drag icon or title bar; or **<Alt><Minus> • Move**, cursor to new location, **<Enter>**
Resize group window	Drag window border's side or corner; or **<Alt><Minus> • Size**, cursor to select side and size window, **<Enter>**
Move item icon to new group	Select icon, **<F7>**, select group in To box, OK; or drag icon to new group

Fold Here

Copy item icon to new group	Select icon, **<F8>**, select group in To box, OK; or hold down **<Ctrl>**, drag icon to new group
Launch program	Double-click icon; or select icon, **<Enter>**
Open task list	**<Ctrl>-<Esc>**
Bring running program to foreground	Hold down **<Alt>**, **<Tab>** until name appears; or open task list, select program, **Switch To**

MANAGING DIRECTORIES

Select directory	Click or cursor to folder icon or name in Tree pane
Create directory	Select parent directory in Tree pane, **File • Make Directory**, type name, OK
Delete selected directory	**<Delete>** or **File • Delete**, OK, **Yes**, **<F5>**
Rename selected directory	**File • Rename**, type name, OK, **<F5>**
Copy selected directory	Drag folder to new parent in another drive window; or **<F8>** or **File • Copy**, **Select**, select parent, OK, **<F5>**
Enable/disable collapsible trees	**Tree • Use Collapsible Tree**
Expand branch one level*	Double-click parent folder or name; or select parent, **<Plus>** or **Tree • Expand One Level**
Expand branch fully*	Select parent, **<Asterisk>** or **Tree • Expand Branch**
Expand all branches*	**<Ctrl>-<Asterisk>** or **Tree • Expand All**
Collapse branch*	Double-click parent; or select parent, **<Minus>** or **Tree • Collapse Branch**
Collapse all branches*	Double-click root directory folder; or **Tree • Collapse All**; or select root, **<Ctrl>-<Minus>**

*Collapsible trees must be enabled (+ and – are displayed in folders).

MANAGING FILES

Select file	Click or cursor to file icon or name in File pane
Select adjacent files	Select first file, hold down **<Shift>**, select last file; or click first file using right mouse button, drag to last file
Select nonadjacent files	Select first file, hold down **<Ctrl>**, select others; or right-click files
Select all files and directories in active File pane	**<Ctrl>-<Slash>** or **File • Select • All**
Deselect all files and directories in active File pane	**<Ctrl>-<Backslash>** or **File • Deselect • All**
Select file(s) by extension	**File • Select • Some**, type extension, OK
Print selected file(s)	Drag file(s) to Printer icon, OK; or **File • Print** • OK
Associate file with program	**File • Associate**, type file extension if none shown, select program if none shown, OK
Change drive window's sort order	**View • Sort By**, select category
Copy selected file(s) to different directory	Drag file(s), **Yes**; or **<F8>** or **File • Copy**, **Select**, select parent directory, OK
Copy selected file(s) to drive	Drag file(s) to drive icon, **Yes**

Fold Here

Move selected file(s) to different directory	Hold down **<Alt>**, drag file(s) to parent, **Yes**; or **<F7>**, **Select**, select parent, OK
Move selected file(s) to drive	Hold down **<Alt>**, drag file(s) to drive icon, **Yes**
Delete selected file(s), reserving option to undelete	Drag file(s) to SmartErase tool, **Yes** or Yes to **All**; or **<Delete>** or **File • Delete**, OK, **Yes** or Yes to **All**
Undelete file	Double-click SmartErase tool or **Tools • UnErase**, select file's parent directory, select file, UnErase
Delete selected file(s) permanently	Drag file(s) to Shredder, **Yes • Yes**; or double-click Shredder, OK, **Yes • Yes**
View selected file(s)	Drag file(s) to Viewer; or open Viewer, **File • Open**, choose file, OK
Find file(s)	**File • Find**, type name and/or select file type, select search location, **Find**
Rename selected file(s)	**File • Rename**, type new name, OK
Edit text file	**Tools • Desktop Editor • File • Open**, select file, OK; or drag file from drive window to open Desktop Editor window or icon
Load selected data file in associated program	Double-click file; or **<Ctrl>-R** or **File • Run**, OK

USING TOOLS

These tools are available through the Tools menu or in the Norton Desktop Applications group.

Create batch file	Batch Builder
Create macro	Macro Builder
Open tape/financial/scientific calculator	**Calculator • Calculator • Tape/Financial/Scientific**
Find special character	KeyFinder
Schedule *NDW* event or reminder	Scheduler

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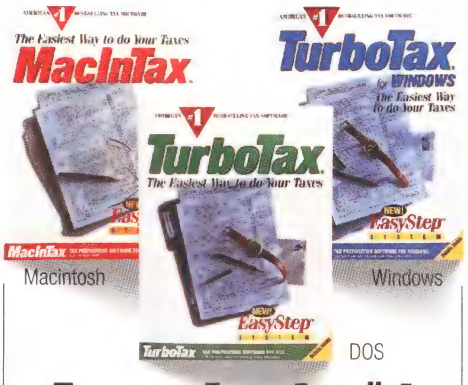

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PCW-3/93

Circle 212 on reader service card


```
Chr$(192)   À
Chr$(200)   È
Chr$(204)   Ì
Chr$(210)   Ò
Chr$(217)   Ù
Chr$(224)   à
Chr$(232)   è
Chr$(236)   ì
Chr$(242)   ò
Chr$(249)   ù
```

FIGURE 1: USE ASCII CODES to produce vowels with grave accents.

the character you're looking for. The appropriate key code should appear in the lower right corner of the window.)

To create the macros, select *Tools•Macro*, type **InsertAcute**, and click *Edit*. Inside the macro editor, type the macro as shown in Listing 4, and check it carefully. Then highlight all the macro lines except for Sub MAIN and End Sub, press **<Ctrl>-C** to copy the macro lines to the Clipboard, and press **<Ctrl>-<F4>** to exit. Now select *Tools•Macro* again, type **InsertGrave**, and click *Edit*. Press **<Ctrl>-V** to paste in the first macro's lines, substitute the values shown in Figure 1 for those characters using grave accents, and press **<Ctrl>-<F4>**. Once you've created both macros, the next step is to assign the hot keys. Select *Tools•Options*, and press **K** to get to the Keyboard Options dialog box. Highlight the macro on the Macros list, and use the Shortcut key box to assign it a key combo (I use <Ctrl>-<F11> for acute and <Ctrl>-<F12> for grave). Next time you need an acute *a*, just type **a** and press **<Ctrl>-<F11>**. Remember to save glossary changes when you exit *WinWord*.

By Brett Glass

Brett Glass is a contributing editor for PC World.

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HOW TO FILL OUT THE FORM: FOR BEST RESULTS, PHOTOCOPY THIS PAGE; DO NOT TEAR IT OUT. Using black pen, clearly print your name (use block capital letters) and phone number at right; fill the appropriate circle under each digit of your phone number. Below, fill the circles under the answers that apply to each article you read. First tell us whether you read the entire article or just some of it. If you didn't read it at all, leave the line blank. If you read the article, please rate its value to you on a scale from 1 (least valuable) to 5 (most valuable). WHEN FILLING THE CIRCLES, AVOID GOING OUTSIDE THE LINES! One entry per person.

First name

Last name

Daytime phone number

1	○	○	○		○	○	○		○	○	○	○
2	○	○	○		○	○	○		○	○	○	○
3	○	○	○		○	○	○		○	○	○	○
4	○	○	○		○	○	○		○	○	○	○
5	○	○	○		○	○	○		○	○	○	○
6	○	○	○		○	○	○		○	○	○	○
7	○	○	○		○	○	○		○	○	○	○
8	○	○	○		○	○	○		○	○	○	○
9	○	○	○		○	○	○		○	○	○	○
0	○	○	○		○	○	○		○	○	○	○

	Did you read it?		Value to you? (Least 1 – 5 Most)				
	All	Some	1	2	3	4	5
Sample	◉	○	○	○	○	○	◉
In This Issue (page 13)	○	○	○	○	○	○	○
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Real Problems, Real Solutions (page 41)	○	○	○	○	○	○	○
What's Next (page 47)	○	○	○	○	○	○	○
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A Trio of ASTs (page 54)	○	○	○	○	○	○	○
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Microsoft Profit accounting software (page 62)	○	○	○	○	○	○	○
New Products (page 75)	○	○	○	○	○	○	○
Marketplace (page 105)	○	○	○	○	○	○	○
486DX2-66s: Fastest PCs (page 108)	○	○	○	○	○	○	○
Is Your New Software Secondhand? (page 134)	○	○	○	○	○	○	○

	Did you read it?		Value to you? (Least 1 – 5 Most)				
	All	Some	1	2	3	4	5
Tips to Organize Your Hard Disk (page 144)	○	○	○	○	○	○	○
Deep in the Art of Taxes (page 163)	○	○	○	○	○	○	○
Dot Matrix Lives! (page 175)	○	○	○	○	○	○	○
Getting There With Software Maps (page 182)	○	○	○	○	○	○	○
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Spreadsheets (page 200)	○	○	○	○	○	○	○
Word Processing (page 206)	○	○	○	○	○	○	○
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Publishing & Presentations (page 218)	○	○	○	○	○	○	○
Communications (page 220)	○	○	○	○	○	○	○
Star-Dot-Star (page 222)	○	○	○	○	○	○	○
IRC: Norton Desktop for Windows (page 227)	○	○	○	○	○	○	○
Business Fixtures (page 265)	○	○	○	○	○	○	○
Managers of the Universe (page 271)	○	○	○	○	○	○	○
Home Office (page 274)	○	○	○	○	○	○	○
HOW WOULD YOU RATE THIS ISSUE OVERALL?			○	○	○	○	○

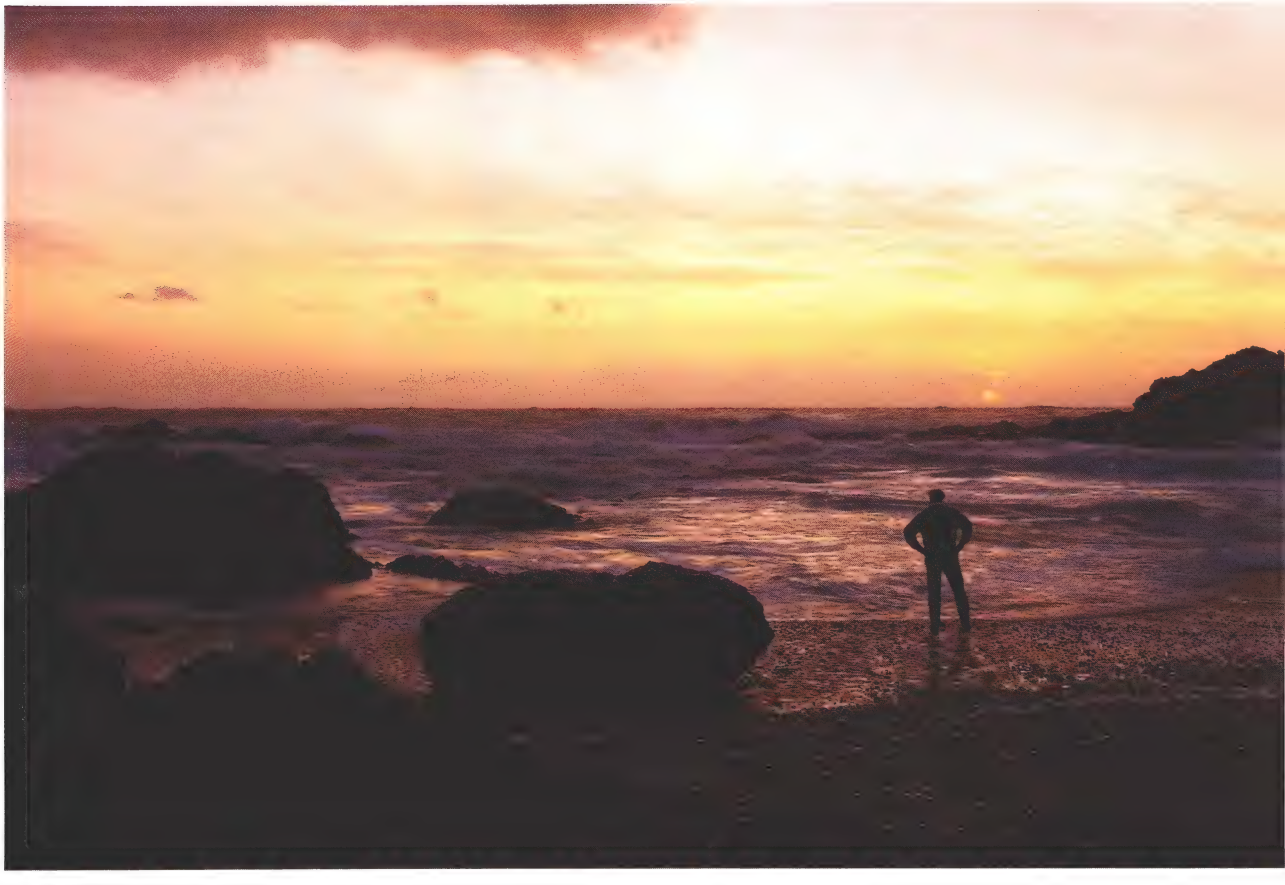
Are you or your company struggling with a PC problem? We want to help. Tell us what business/technology problems and solutions you want us to examine in *Real Problems, Real Solutions; PC World Adviser;* or elsewhere in the magazine.

_____

_____

_____

PLEASE FAX TO 415/267-1779



You can get your feet wet, or plumb unimaginable depths.

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Now, for just $8.95 a month, and a one-time membership fee, you get all the basics as often as you like: news, sports, weather, shopping, a complete encyclopedia, and much more, plus up to 60 E-mail messages a month. And, there are lots of other valuable services available on a nominal pay-as-you-use basis.

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Circle 33 on reader service card

PC WORLD CATALOG

Shop The PC World Catalog For Fast Solutions To Your PC Needs

The *PC World* Catalog is the most cost efficient way to bring your product message to managers proficient with PCs, the group identified by study after study as today's key buyers of computers and related equipment.

Your message can reach buyers in a variety of ways. The "Business Class" section brings your ad to our 901,000 readers with four-color impact. *PC World's* "Computer Showplace" section highlights your ad in black and white, with a choice of display or text/only formats (standard red can be added as a second color).

For complete information on Catalog advertising, please call toll-free 800-262-9885 or 203/838-1425 Fax. PC World Catalog , c/o RAM, 50 Washington Street, South Norwalk, CT 06854.

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Product Category	New Product	Business Class	Computer Showplace
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Special Advertising Section in PC World

NEW PRODUCT INTRODUCTIONS

All material supplied by advertisers. For advertising information, contact PC World Catalog Sales Group at 203-853-6795

SECURE THAT NOTEBOOK COMPUTER

Secure-it, Inc. recently announced its new, patent pending, KABLIT VANGUARD SECURITY SYSTEM for notebooks. In the photo, it is shown attached to an AST Notebook Computer.

The KABILT VANGUARD attaches to the screw holes of any available (unused) parallel, serial, VGA, or RGB port on the rear of a computer. These are also referred to as DB25, DB15, or DB9 connector ports. There is no electrical contact made to the interface port or its pins.

It's simple! Just secure the KABILT VANGUARD adapter base over the selected port, attach the lock body and vinyl coated, steel security cable into place and remove the key. The other end of the cable is fastened to the work station in one of three optional methods. You can secure up to two additional peripherals as well. The KABILT VANGUARD is compatible with any computer except the Macintosh.

The KABILT VANGUARD can be used in both the office and in transient situations as the kit provides for non-permanent anchoring. This feature is especially important to notebook and laptop users. An attractive carrying pouch is included and fits nicely in a briefcase.

KABILT VANGUARD retails for $49.95

18 Maple Court, East Longmeadow, MA 01028 • 800/451-7592 • 413/525-7039

CIRCLE 553 ON READER SERVICE CARD

The Bundle of the Year! Faxscanner with TypeReader

The ultimate Data Entry System! Scan, Print, Send, Receive, and Enter Text and Data, All From a Fax Machine!

Introducing a new era in data entry: Faxscanner is the wonder device that transforms any fax machine into a full page scanner. TypeReader is the OCR with accuracy close to 100% that eliminates the costly and time consuming re-typing! With this bundle you can quickly, and easily convert the printed image into electronic format. With one simple step, business letters, contracts, forms, tables, resumes, newspapers are converted into most popular word processing, spreadsheet, database and page layout formats.

The List price of TypeReader is $695.00 and Faxscanner is $99.00.

You can now get your Faxscanner with Typereader for the special price of only $219.00.

Also available: Faxscanner $69.00 • Faxscanner with Worldfax $149.00 • Worldfax $99.00

Class II Faxmodems available!

TO ORDER CALL: UNIVERSAL COMPUTER: 800/457-4433 • FAX: 305/446-9928

4401 Ponce De Leon Blvd. Coral Gables, FL 33146

CIRCLE 475 ON READER SERVICE CARD

How to Make Your Product Leap Off the Shelf

It's no secret anymore. *PC World's* "Computer Showplace" has become one of America's most successful selling platforms for hardware and software. Reader responses for the last twelve months have <u>averaged</u> 398 replies per ad, an increase of 43% over the prior year. And the price is remarkably affordable. A 2" ad in "Computer Showplace" costs about $1100 at the 12 time rate. So figure it out -- if your ad just pulls the typical response of 398 inquiries, can you afford NOT to advertise in *PC World?*

"Finally, A PC Desk That's Tailored For You."

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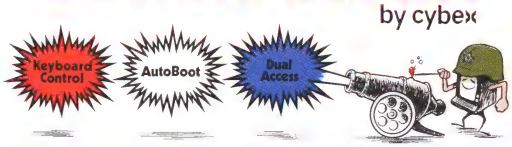
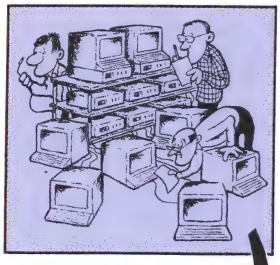
CIRCLE 409 ON READER SERVICE CARD

CONTROL UP TO 96 PC FILE SERVERS WITH 1 KEYBOARD AND MONITOR USING...

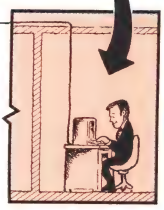
COMMANDER by cybex



- Select via Keyboard
- Dual access up to 250 feet away (optional)
- No external power
- Mix PC, PC/XT, PC/AT and PS/2
- "AutoBoot™" Feature boots attached computers without operator intervention
- Shows PC power status



- PS/2 Mouse support available
- Each unit accommodates from 2 to 8 PCs
- Up to 12 units can be cascaded
- Mounting kit available for 19" and 24" rack installation



Dealer Program Available

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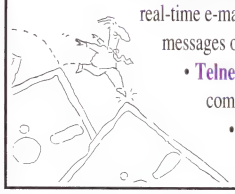
- Telnet — connect to colleges, companies, and other networks.
- FTP — transfer files immediately from other hosts.



Here's How:

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At Password, type INT33

Questions? 1-800-695-4005

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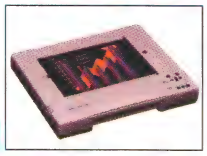

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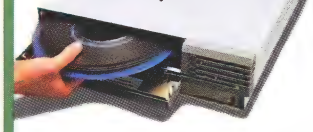

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FACT: *56% of PC WORLD subscribers reported making purchases "immediately" or "very soon" after seeing an ad in the magazine.*

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CIRCLE 483 ON READER SERVICE CARD

FACT: 61% of PC WORLD subscribers purchased software from mail order firms.

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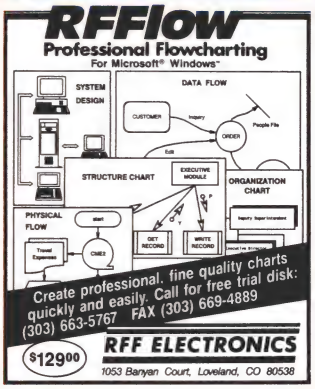

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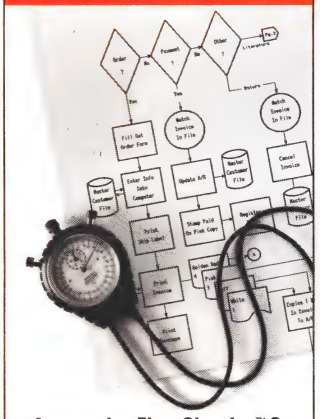

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Circle 250 on reader service card

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PS/1 Consultant , Essential & Expert models x76
16MB Kit PN NA $579
PS/2 25/286, 30/286, & memory adapter 1497259
2MB Kit 30F5360 ..... $89
PS/2 35SX; LS, 40SX, 50Z, 55SX; LS, 65SX; LS, 70, & XStation
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2MB 6450604 or 90X8625 ..... $79
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2MB 6450608 ..... $79
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2MB 6450902 ..... $89
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ProLinea 4/25s, 4/33, 4/50
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4MB 141684-001 .. $159 8MB 141685-001 .. $309
DeskPro 386-20, 20e & 25
4MB 113132-001 ..... $169
DeskPro 386s/16
4MB 112534-001 ..... $169
DeskPro 286N; 386N; I Series; 386SX/20; 20N; Portable 486c; M Series expansion boards; SystemPro LT Series
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4MB 118690-001 .. $149 8MB 112877-001 ... $309
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DeskPro 386M, 486M, SystemPro LT (32-Bit Exp. board)
2-64MB w/2M 129160-001 ..... $359
DeskPro 386/33L, 486/33L, SystemPro
6 Socket Brd w/2MB 116569 + 115144-001 ..... $389

DELL

Power Desktop 325D & P, 333D & P, 433P, 486P & 486D
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8MB 310-2468 ..... $319 16MB 310-2469 ..... $629

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Bravo 3/33s
2MB 500962-001 .... $75 8MB 500962-002 .. $379
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Vectra 486PC; 25T; 33T; 486s/20; 486/25N; 33N; 50N; 66N
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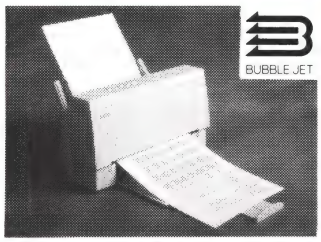

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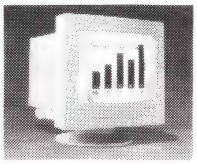

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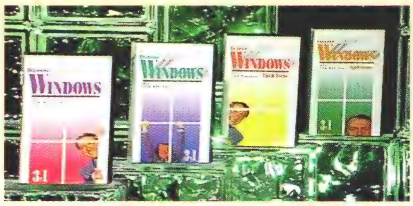

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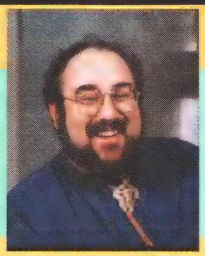

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DeskPro 386/20E	1Meg Exp Bd	113644-001	119.00
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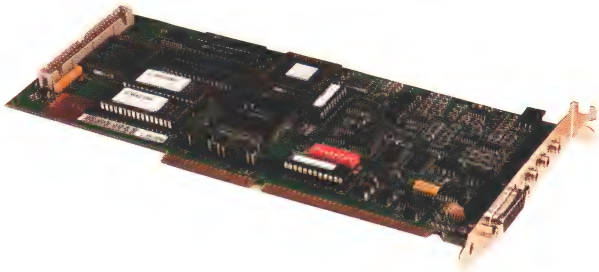

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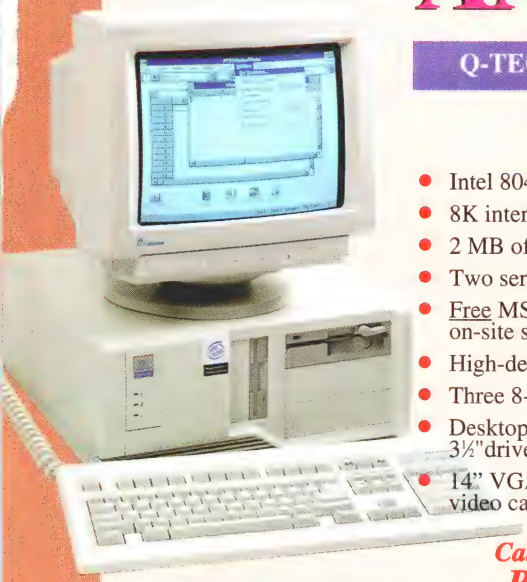

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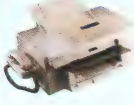

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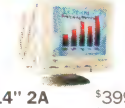

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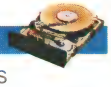

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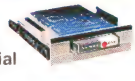

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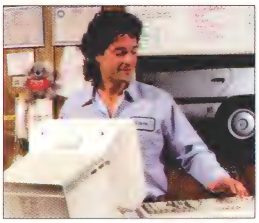
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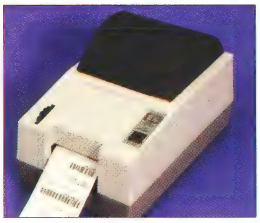
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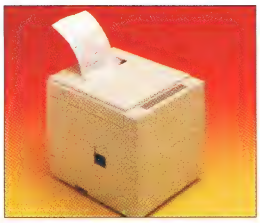
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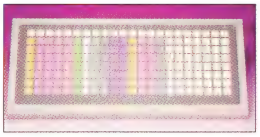
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Circle 168 on reader service card

Hot Products Challenge the Status Quo

Pity the poor office manager who must decide among three preeminent *Windows* graphical word processors—Lotus's *Ami Professional*, *Microsoft Word for Windows*, and *WordPerfect for Windows*. The Lotus entry makes the decision particularly difficult: While it doesn't have the market share of the other two, it's a clear title contender and the package against which all word processors should be judged.

The latest *Ami Pro* is not the only fresh release that will force new decisions on *Windows* users. Two recent Macintosh emigrants—*QuarkXpress 3.1 for Windows* (desktop publishing) and *MicroPhone Pro for Windows* (telecommunications)—are also worthy challengers in their fields, while *Metz Task Manager* offers creative shortcuts for handling your *Windows* desktop.

The hardware community isn't making purchasing choices easy, either. This month I'm tempted by a *Windows*-ready notebook—Texas Instruments' TravelMate 4000 WinSX—and will sample some high-speed file transfers from a BBS with the tiny Practical Peripherals PM14400FX fax-modem.

QuarkXPress 3.1 for Windows

I kicked things off by trying to open a file created on the Macintosh version of *XPress*. Surprise! A dialog box immediately listed the necessary fonts my PC lacked. Other desktop publishing packages would have left me searching for the font mismatches or simply scratching my head, but here they were, listed by name and point size. I gave *XPress* the go-ahead to substitute installed fonts, and the document appeared on screen. Quark has achieved cross-platform file compatibility, at least in one direction. (Quark promises *XPress 3.2* for the Mac, slated to ship later this year, will be able to read *XPress for Windows* files. Current *Windows* and Mac versions are both $895.)

Desktop publishing has become a skilled profession, and its software tools cannot be glibly described as easy to use. But I surely wish I'd had this power in the days I was a front-page editor for a daily newspaper. I'd have put the effort into learning *QuarkXPress* from bottom to top.

Former front-page editor Foulks exercised QuarkXPress by laying out a mythical tabloid.

Time will tell whether *QuarkXPress for Windows* truly answers desktop publishers' need for cross-platform compatibility and whether it meets the top-rated quality of the Mac version. I'll bet it does, and that makes it a Foulks' Favorite. I've already seen power in it that no other product has.

Ami Pro 3.0

In the box you'll find a $9.95 coupon to order the *Macro Developer's Kit* by mail. Use it if you want to grasp the full scope of this new word processing powerhouse. Don't just take my word for it—read the GOODIES.SAM samples file that installs with *Ami Pro*. See how a macro looks up a geographic location by its area code, even displaying time zones. Or find and replace a given text string across a multiple document list—and then do an updated printout of the list while you're out to lunch, by using the Set Time button.

The *MDK* provides a thick macro language manual with examples of how all the functions and control statements operate, plus more sample macros—including one that writes a story based on your characters and plot twists.

Even if you find macros foreign, *Ami Pro 3.0* has other features to improve your workday. For example, whenever your mouse pointer is over an on-screen button, you can pop up a small help line by clicking the right mouse button. If you don't want your screen cluttered with icons and buttons, the Clean Screen mode shows just the cursor, your text, and one small button to restore the standard screen. Like all new Lotus *Windows* products, *Ami Pro* has SmartIcons—buttons that you can redesign and reconfigure as you see fit.

Yet, it *is* traumatic to switch word processors, no matter the amount (lots!) of context-sensitive help available. Users moving to *Windows* from DOS can fearlessly choose the latest *Ami Pro* version. *Windows* veterans will need to consider seriously whether *Ami Pro*'s cosmetic advantages can significantly improve the printed output (and I *am* considering it). The suggested retail price is $495, but look for street prices as low as $95 for a competitive upgrade. (You can download a demo version from PC World Online's Test Drive folder.)

MicroPhone Pro for Windows

MicroPhone, in various versions, has a solid reputation among Macintosh users. In this $195 initial version for *Windows*, Software Ventures Corpora-

By Thom Foulks

tion has integrated *WinFax Lite* from Delrina Technologies to produce an all-in-one telecomm/fax package. That's an attractive approach, but unfortunately, the fax program is not particularly impressive. *WinFax Lite* installs itself on your printer list, and you can access it most directly by using an application's commands for changing the default printer instead of using *MicroPhone*'s separate Fax command menu.

For something truly significant, though, look no further than *MicroPhone Pro*'s tremendous scripting capabilities (more than 200 commands and functions). Scripts are a series of commands that automate the process of logging onto various telecomm services, whether CompuServe or a neighborhood BBS. "Even novices can script," brag the product's ads, and the Watch Me mode proves it. I developed a script to log on to my own BBS in just a few minutes.

A surprising inclusion is support for multimedia, including playback of CD and MIDI files. You can even use scripts to control a multimedia presentation—novel, but again, of limited interest. Veteran telecommunicators will search in vain, however, for file transfer protocols other than XMODEM, YMODEM, and ZMODEM.

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Practical Peripherals PM14400FX Modem

Hayes subsidiary Practical Peripherals calls this tiny 4.2-ounce fax-modem a pocket unit, though it won't do anything until you plug in the AC adapter or install a battery pack, both of which are also pocket size but not likely to share the same pocket. Facing reality, the firm ships all the modem's hardware items in a dainty 8-by-5-by-2-inch leather pouch.

Aside from truth-in-advertising questions, this is the real bargain product in this month's collection. It transmits at up to 57,600 bps for data and 14,400 bps for fax, is indeed portable, and lists for $499. Its street price—around $320—will likely threaten some of its larger competitors.

Its outstanding feature is the unique help facility in ROM. Keying AT$H in command mode brings you six ROM-based help screens. They display modem parameters, options for every parameter, and a list of the various AT commands used with the modem. In essence, the screens are an online reference manual, always available—even in a hotel room. No need to carry the manual in your pocket . . . or the pouch.

Modem users trying to find the 14,400-bps option on their modem parameters' setup screen will discover it's not included in the Smith-Micro *Quick Link II* software bundled with this unit. Not to worry—most telecommunications packages lack that parameter. You solve the menu omission by setting speed at a higher pace—say, 19.2 kbps—and allowing the modem to transparently negotiate its own speed, once on line. My first 14.4-kbps log-on was with Practical Peripherals' own BBS. I sampled the fax and data capabilities of the PM14400FX with *QLII*, *MicroPhone Pro*, *WinFax Pro*, and *Procomm Plus* and found no unpleasant surprises. It is fast—'nuff said!

Texas Instruments TravelMate 4000 WinSX

I think that I shall never see a trackball built just right for me. After trying to use the TravelMate's matchbox-size TravelPoint

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DRAWING	Supports TrueType & Type 1 fonts	●	●	●	●	●			●	●	Industry standard font formats
	Interactive on screen kerning	●						●			Click and drag text kerning
	Spelling dictionary	●	●	●	●						Catches your spelling mistakes
	Hyphenation	●									Improves word spacing in narrow columns
	Thesaurus	●									Synonyms are just a mouse click away
	Text remains editable when										
	Rotated/skewed	●					●	●			Correct spelling mistakes and make font changes without
	Extruded	●									removing transformations or special effects
	Fit to a curve	●					●	●			
	Enveloped	●									
	Recolor characters individually	●	●	●	●		●				No need to separate text string
	Number of fonts	253	13	22	15	175	40	4			Target your audience with the right font
	Blend shapes and colors	●						●			Realistic shading & novel shape transformations
	Automatic reblends	●						●			Live blending allows for instant feedback
	Blend along a path	●									Blend elements can follow a chosen path
	Blend groups of objects	●									Several objects can be blended at once
	Link blends together	●									Blended objects can remain grouped
	True mathematical perspective	●									Object recedes towards a movable vanishing point
	Enveloping	●									Warp any object using a rubber-band envelope
	Generate 3-D extruded objects	●									Convert 2-D objects to 3-D appearance
	Rotate and recolor	●									Rotate in 3-D space with automatic color refresh
	Simulate light source	●									Create realistic shading with a movable light source
	Fit text to path										
	Interactive placement of text	●					●				Click and drag text along path
	Align to baseline, ascender, descender	●						●			Adjust vertical position of text above, below or on path
	Fit multiple text strings to path	●									One path can be used for multiple text strings
	Autoupdate when path is changed	●					●	●			Text reflows automatically when path is altered
	Maximum number of layers	Unl.				64		Unl.			Simplify complex drawings with multiple layers
	Lock, hide and print layers	●									Extensive layer controls let you work effectively
	Number of graphics import filters	16	9	14	7	10	9	5			Import charts and graphics
	Number of graphic export filters	18	5	1	5	12	10	12			Export to all popular programs
	OLE Support	●		●		●			●		Allows quick access to your drawing
	Pantone and TruMatch color systems	●					●				Industry standard color matching systems
CHARTING	Number of chart types available	79	15	19	35		6				Choose the chart type that best suits your data
	Ring pies, 3-D bar, scatter & surface	●									Add impact using a variety of chart types
	Histograms	●									Show frequency of values in a data set
	Pictographs	●									Show data using a repeated picture
	Dual axes	●	●		●						Allows two sets of values for X or Y
	Bipolar charts	●			●						Split chart at zero point for positive/negative values
	Rotate, zoom 3-D charts	●									Interactive 3-D manipulation
	Number of series	16000	26	4000	16		1000				Chart more data
	Number of pies per chart	Unl.	4	1	6		1				Compare more data sets
	Remove and restore pie slices	●			●						Add emphasis by removing slices
	DDE links	●	●		●						Update chart data automatically with DDE links
	Excel 3.0 import	●		●	●						Use existing Excel data to create charts
	Lotus 1-2-3 import	●	●	●	●						Use existing 1-2-3 data to create charts
	Harvard Graphics charts import	●			●						Enhance existing Harvard Graphics charts
	Sort and exchange data series	●									Organize your data without manual re-ordering
	Plot regression lines	●			●						Indicate trends in data
	Visual menus	●									Thumbnail samples make menu selection easy
	Context sensitive menus	●									Intuitive pop-up menus change to suit context
	Free form data input	●			●						No need to enter data in a pre-determined way
	Libraries of editable fountain fills	●									Ready-made gradient fills can be modified
	On-screen color palette	●									Choose chart element colors on screen
	Includes libraries of textured fills	●									Use textures to dress up backgrounds
PRESENTING	Slide sorter view	●	●	●	●						Reorder, insert and delete slides
	Play animated flics	●									Use any Autodesk .FLI or .FLC animation file
	Number of animations included	152									Ready-to-use general purpose animations
	Number of transition effects	16	13	45	15	4					Variety of transitory wipes used between slides
	Control transitions per slide	●	●	●		●					Assign different transitions for each slide
	Automatic or manual slide shows	●	●	●	●	●					Timed self-running or manual advance
	Play sounds during show	●		●							Use recorded sounds to liven up your show
	On screen status line	●									Monitor timing and slide transitions
PAINTING/PHOTO EDITING	Convert to any color depth	●							●	●	Choose from 1, 256 or over 16 million colors
	Select by color or range of colors	●							●	●	Automatically select area(s) based on color
	Special effects filters	12							18	27	Apply special effects like motion blur, emboss, etc.
	Paint tools: brush, airbrush, paintcan	●							●	●	Create images from scratch using basic painting tools
	Flip and rotate images	●							●	●	Allows you to place image as needed
	Control of brush sizes and shapes	●							●	●	Adjust to change look of brush stroke
	Control transparency & opacity	●							●	●	Create interesting overlay effects
	Magic wand selection	●							●	●	Automatically selects irregular areas
	Apply filters to selected areas only	●							●	●	No need to cut and paste
	Channel response curve control	●							●	●	Adjust color channels as needed
	Color replacer	●							●	●	Search and replace colors or range of colors
	Cloning tool	●							●	●	Copy one area of image to another area
	Preview effects	●									Avoids having to undo and re-apply effect
	Automatic locator tool	●									Displays the same area in all active views
	Tiling of fills	●									Use a scanned image as a fill pattern

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trackball in editing portions of this column, I gave up and decided to rearrange the default *Windows* desktop more to my liking. A half hour later, I gave up on that, too, and shut down the notebook to install a traditional mouse so I could untangle the disarray I'd made with the intractable trackball. [Trackball appreciation seems to be highly individual. The TravelPoint trackball is our editor-in-chief's favorite. —*Ed.*]

There is indeed 486SX-25 power here, in 5.5 pounds on an 8.5-by-11-inch footprint, but not without trade-offs. Hard-core touch-typists may not appreciate the small cursor-control and function keys. Users looking for a small desktop unit should note that the side-mounted ports produce a sprawl of spaghetti when mouse, external modem, printer, and external monitor are attached.

On the plus side, the $2799 unit has some of the best power-saving options on the market. After charging the battery overnight, I spent more than 2 hours transferring some standard work files to it, then nearly another hour arranging screens and icons before the low-battery light began blinking. Usage with less hard disk activity would easily have topped 4 hours.

With *Windows 3.1* installed, the WinSX is a fine machine. But what's the point of *Windows* on a notebook computer without an adequate pointing device? Someone needs to find an answer to this question.

Metz Task Manager 2.0

There's not enough space here to describe fully the functionality this program-launching and file management utility adds to *Windows*. Even with *Norton Desktop for Windows* in use, I call upon the *Metz* Quick File Find and Quick Text Search components frequently. *Task Manager* itself is a mere <Ctrl>-<Esc> away, popping up a neatly framed box of icons to launch your customized tasks or switch to running ones.

With version *2.0*, the $49.95 *Metz* has become smarter, easier to install, *and* easier to uninstall (part of a growing trend, I hope). Although the program is now distributed through software discounters, uncrippled evaluation copies remain available from online services, including PC World Online (in the Featured in March folder), as well as many BBS's. It is definitely worth your time for a free look at how to handle file-management and file-access chores without resorting to the DOS prompt.

- **QuarkXPress 3.1 for Windows** Quark Inc.; 800/788-7835
  Reader service no. 630
- **Ami Pro 3.0** Lotus Development Corp.; 617/577-8500
  Reader service no. 631
- **Metz Task Manager** Metz Software Inc.; 800/447-1712
  Reader service no. 632
- **MicroPhone Pro for Windows** Software Ventures Corp.; 510/644-3232
  Reader service no. 633
- **Practical Peripherals PM14400FX** Practical Peripherals; 805/497-4774
  Reader service no. 634
- **TravelMate 4000 WinSX** Texas Instruments Inc.; 800/527-3500
  Reader service no. 635

Thom Foulks is a contributing editor for PC World. ■

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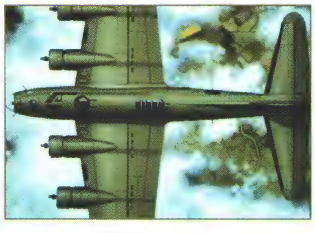

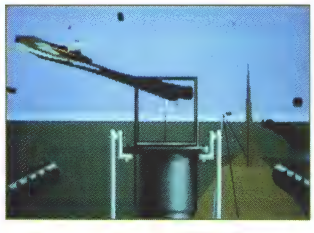

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Adventure on the High Seas and Beyond

If you can handle the concept of a three-masted schooner that travels between the stars *and* fights with catapults, you'll find much to like in *SpellJammer: Pirates of Realmspace,* an amusing hybrid of sailing and outer space adventure.

Your space-traveling sailing ship lets you navigate the eight planets of the Realmspace system (originally found in the popular *Forgotten Realms* series), trading, taking on occasional diplomatic missions, and politicking in port. On your way from planet to planet, you'll encounter space pirates, rival merchant ships, and even a few monsters. As a merchant-adventurer, your ability to manage your 12-person crew will advance your fortunes as much as your mercantile skills or fighting ability. Even in outer space it seems a good manager is hard to find.

A well-designed, mouse-based interface makes playing easy, and the graphics are quite good. Whether you're blasting a space pirate whose ship looks like a short-tempered wasp, duking it out hand-to-hand with marauders intent on scuttling your schooner, or buying a round of drinks in a bar, *SpellJammer*'s design helps preserve the illusion that you're really there. The sound effects of this charmingly schizoid game are first-rate, but you'd better know what interrupt and DMA channel your soundboard uses: If you guess wrong, *SpellJammer* may not load at all.

Wild Women of Wongo

From the artful start-up sequence, in which a scratchy film counts down 5...4...3, to the eagle-emblazoned Access logo that echoes the opening of Republic Pictures' classic adventure serials, there's little doubt what inspired *Amazon*. This light-hearted role-playing game is even divided into serial "chapters," complete with opening synopses to bring you up to speed. The chapters make playing a snap, since even a part-time gamester should be able to get through one in an evening.

By Michael Goodwin

The premise is standard serial stuff: As a young scientist, you must make your way into the remote upper Amazon to save your naturalist brother from a horrible fate. To get there, you track down keys, books, safe combinations, recorded messages, and the usual assortment of treasure-hunt items, evading unwelcome attention from trigger-happy security guards and officious secretaries in the process.

If the plot and puzzle aspects of *Amazon* are a bit familiar, the images that propel the tale are anything but. The opening credit sequence looks like a wide-screen color movie panning across the jungle. And while most subsequent scenes play out via conventional computer animation, a number of characters are rendered with near-photographic clarity, and move with cinematic smoothness. They even have synchronized dialog. In fact, it wouldn't surprise me to discover that sequences for this game were filmed with live actors and then transferred to disk—at less than full-motion frame rate, of course, but still with stunning effect.

Unfortunately, the playing interface isn't quite as slick as the cinematic animation. You have to use both arrow keys and the mouse to walk, climb, talk, and manipulate objects, which can get tedious very quickly. For instance, even if you've already finished exploring a room, if you walk past it you automatically enter again. Moreover, many of the action controls seem sticky: Time and again the game required that I hit keys repeatedly to go through a door I had just opened or to make my way around an object.

With SpellJammer, there's commerce between space wars. Even in outer space, money talks.

There's a built-in hint system that you can use if you like. Unfortunately, the hint system keeps count of how many times you use it. After a certain limit, all it offers are egregious insults about how stupid you are—less than charming.

Fortunately, there's enough charm in the rest of *Amazon* to make up for the ill-tempered hint system. To take just one example, there's an outrageously silly home movie called "Wild Women of Wongo" that made me roar with laughter for a full minute! I've yet to make it all the way to the Amazon, but I have a feeling the fun is just starting.

Not for Gun-Control Advocates

Firing up *Wolfenstein 3D* is a bit like turning into Steve McQueen and falling head-first into *The Great Escape:* You become B.J. Blazkowicz, a tough-as-nails military espionage operative, trapped behind the Nazi lines in Castle Wolfenstein. And in the grand tradition, you need to shoot your way out.

The game is a World War II remake

THE AMAZON HAS MORE THAN 1000 TRIBUTARIES—and your adventures may take you up more than a few of them.

of Dungeons and Dragons. You explore rooms, blast Nazis, search for secret passages, and collect weaponry and treasure on your way to the exit. What makes *Wolfenstein 3D* special is its incredibly responsive interface. You never see B.J.; you *are* B.J., and you view everything through his eyes. Perspective is perfect. As you maneuver around a potted palm to get a better shot at an SS bad guy, the entire scene shifts and foreshortens instantaneously. Sound effects are great too.

The controls are so easy to use that once you get the hang of them, you'll feel like you're flying through the castle corridors. To pick up treasure or a machine gun, simply walk over it. It goes into your stash automatically. Installation is utterly painless, too. Unlike games that make you enter hardware interrupts and DMA channels for your soundboard, this software simply checks out your system and installs itself correctly.

Wolfenstein 3D is easy to play but hard to win. There are six episodes, with ten floors each—and as you complete each floor you're rated against a par score and a clock. Also, there are some *nasty* Nazis waiting to snuff you, and some of the secret rooms are almost impossible to find. But hey, if winning World War II single-handedly were easy, everyone would do it! Incidentally, if you like to try before you buy, you'll be pleased to know that Episode 1 is available as shareware on many BBS's; you'll have to pay for episodes two through six. *Wolfenstein 3D* is big fun—though probably not a great choice for gun-control advocates.

- **SpellJammer** $60; Strategic Simulations Inc.; 408/737-6800
  Reader service no. 724
- **Amazon: Guardians of Eden** $49; Access Software Inc.; 800/800-4880
  Reader service no. 725
- **Wolfenstein 3D** Episode 1 is shareware; Episodes 1 through 3 $35; Episodes 4 through 6 $20; Episodes 1 through 6 $50; Apogee Software Productions; 800/426-3123
  Reader service no. 726

Michael Goodwin is a contributing editor for PC World. *He can be reached on PC World Online (see page 8 for more information).* ■

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Circle 156 on reader service card

Pick a Boot, Any Boot

Something's always forcing me to mess around with my CONFIG.SYS and AUTOEXEC.BAT files. Maybe I use *Windows* one day and plain old DOS the next, or I have to load a particularly monstrous DOS program that demands every speck of conventional memory. I hate fiddling with these system configuration files because I usually honk something up. And let's face it—neither REMing out lines nor rebooting from floppies is an elegant solution.

Fortunately, I've found a few neat tricks to load different AUTOEXECs and CONFIGs automatically and safely; they effectively give me an almost unlimited number of setting combinations. Now I can back up and defrag my hard disk in a squeaky clean environment without worrying that some disk cache is loaded and will scramble my FAT. (Who was it that said "The backup ain't over till the FAT table sings"?)

Do It Yourself

The cheapest solution (it's free) is a batch file trick I learned from fellow *PC World* Contributing Editor Michael Goodwin. You'll need a boot utility to reset your computer. Various boot utilities, most of them free, are available on BBSs; there's a free one on PC World Online—WARMBOOT.ZIP. Check out "Batching the Warm Boot," *User Group Tips*, (July 1992, page 259) to see how to make one yourself.

You use the program in a batch file I've cleverly named REBOOT.BAT. Create it using your favorite text editor.

```
@ECHO OFF
COPY C:\CONFIG.%1 C:\CONFIG.SYS
COPY C:\AUTOEXEC.%1 C:\AUTOEXEC.BAT
WARMBOOT
```

(If your boot utility isn't called WARMBOOT, you'll want to change the last line accordingly.)

Once this file is saved in a directory in your AUTOEXEC.BAT's PATH, create a matched pair of AUTOEXECs and CONFIGs—with appropriate extensions—for every boot variation you want. For instance, AUTOEXEC.STD and CONFIG.STD might load your everyday system full of TSRs, disk caches, and network drivers; while the WIN extension could load *Windows*, VAN might boot DOS with no TSRs at all.

Now, to load a plain vanilla system, you type **REBOOT VAN** (so *that*'s where the extension came from) and press **<Enter>**. The REBOOT batch file then replaces AUTOEXEC.BAT and CONFIG.SYS with the VAN files and reboots the system. Just like magic.

When it's time to return to normal, just type **REBOOT STD** and you're back where you started. If you want to get fancy, you can create a set that has a command line to run your hard disk defragger, REName everything back to STD and WARMBOOT again.

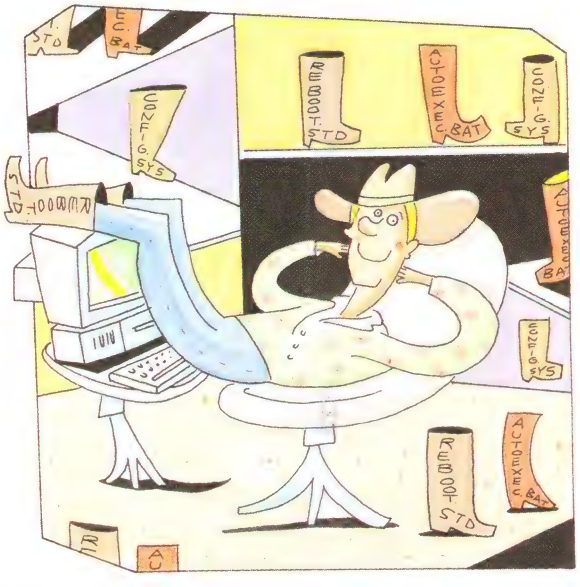
There's a fringe benefit: With this system, you don't have to think twice about letting an Install program rewrite your precious CONFIG or AUTOEXEC. If you don't like the new additions, just run REBOOT STD and you're back to square one. If you like the changes, copy AUTOEXEC.BAT and CONFIG.SYS to the STD versions to make them permanent.

The Ready-Made Route

But there's more than one way to give DOS the boot. Instead of fiddling with batch files, you can buy a program that will automate the process for you. One of the best is CLEAR Software's *Easy Boot*. This $49.95 utility lets you create up to 15 sets of AUTOEXEC and CONFIG combinations and choose any of them using a neat, graphical menu every time you reboot or start your computer. If you use a disk caching program, *Easy Boot* has a feature that delays rebooting to give the cache time to write to disk. And you can use *Easy Boot* without ever having to touch the manual.

If you're interested in trying a multiple boot switching program before laying down any cash, download a copy of *AutoCon*, a nifty $15 shareware program. *AutoCon* is a bit harder to use than *Easy Boot*, but it gives the more expensive program a run for its money with similar features and 50 boot configurations—more than *I'll* ever need.

Rumor has it DOS 6.0 will have a multiple boot feature built in—but hey, why wait? With just a couple minutes and a few bucks, you can boot up with your choice of environment right now.



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WHERE TO BUY

AutoCon 2.0g $15; Larry Weaver; 916/623-5045, 916/623-4455 (BBS)
Reader service no. 601

Easy Boot 1.0 $49.95; Clear Software, Inc.; 800/338-1759, 617/965-5310 (fax)
Reader service no. 602

WARMBOOT utility and batch files Free
Reader service no. 603

Contributing Editor Steve Bass is the president of the Pasadena IBM Users Group. He can be reached on PC World Online (see page 8 for more information).

By Steve Bass

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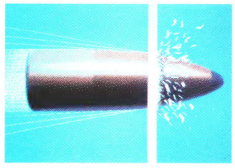

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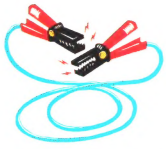

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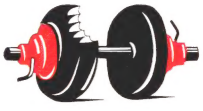

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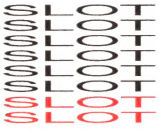

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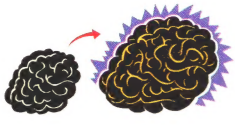

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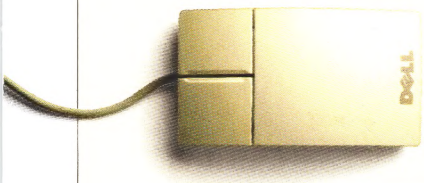

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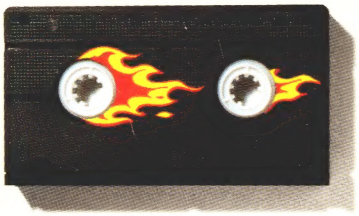

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